World leading airline solutions

CONTENTS

03 FRLs with an added component.
06 No tools required. The Excelon Pro FRL.
08 Tried, tested, top quality accessories.
10 The best solution. Norgren Olympian Plus.
12 Avoid cracking up. Norgren Stainless Steel products.
14 As free as air? Make sure the compressed air you use is as cost-effective as it can be.
16 Have you got the PUWER?
18 Give us your best pneumatics tip and we’ll give you a FREE gift!
Welcome to the first issue of the Norgren Essentials Guide. In this issue we focus on airline products: our range (much of which is available for same-day despatch from Norgren Express), handy tips, and information on effective air preparation.

Norgren founded the airline industry, and more than 80 years on is still leading the field with a wide range of air preparation equipment – so you’re almost certain to find just what you need for your application. And with Norgren Express you can find it more easily, get it delivered faster, and get on with the job more quickly.

**When you need it now**
All the products mentioned in this guide are in stock, ready to go and all manufactured to the highest standards, so you can order with confidence.

If you need help or advice before you place your order, you can call 1.800.959.2504 to speak to one of our fully-trained Norgren Express airline experts. Available from 8.30am – 5pm, Monday to Friday, they can resolve your queries on the spot, or provide access to data or application support if you need it.

Alternatively you can order online 24/7, 365 days a year, at NorgrenExpress.com, where you will also benefit from receiving order acknowledgements and tracking to help you manage your order and plan your work more effectively.

We hope you enjoy this Norgren Essentials Guide. And there’s one essential thing to remember: when you need it fast, Norgren Express makes it easier and quicker for you to get the job done.
FRLs with an added component

If you think an FRL comprises three elements – Filter, Regulator and Lubricator – there’s one thing you’ve overlooked. An NFRL will do the same job but even more effectively.

The ‘N’ stands for ‘Norgren’, and that’s the extra component which makes all the difference. It guarantees the highest levels of performance, quality, value and energy-efficiency, all based on more than 80 years’ experience in air preparation.

So a Norgren FRL promises:
- More effective filtering of moisture content and other impurities
- More constant delivery of the correct air pressure
- Continuous delivery of an adequate flow of lubricant

The result is a constant flow of high-quality air, to help decrease downtime, reduce wear and tear on your tools or other equipment, and increase their working life.

You can find out more about the Norgren Excelon Pro FRL on page 7 of this issue, and the Norgren Excelon® FRL on page 11.

BE PREP-AIR-ED

Fill a standard Oil-Fog lubricator under pressure, without having to switch off the upstream air.

Air preparation tips from Norgren Express.
Over 80 years’ experience on your side.

When a fill plug is removed, a check valve in the lubricator body isolates the inlet pressure from the bowl, and the reservoir will depressurise so the lubricator can be filled with oil. When you replace the fill plug the reservoir will automatically re-pressurize.

However a standard Micro-Fog unit cannot be filled without exhausting the upstream pressure, unless a remote fill or quick fill nipple accessory is fitted. Never remove the fill plug of a Micro-Fog lubricator while it is under pressure.

If in doubt, Norgren engineers recommend shutting off the upstream air.
Airline Range

**EXCELON® PRO – MODULAR SYSTEM**

The latest in air preparation technology Excelon Pro is lightweight and modular. Offering combination units which feature the shut-off valve, filter/regulator and lubricator, Excelon Pro can also be purchased as individual elements. Available in 1/8” - 3/8” port sizes. Excelon Pro requires no tools for assembly.

**EXCELON® – MODULAR SYSTEM**

Offered as boxed combination sets or individual elements, Excelon delivers high efficiency water and particle removal. Available in 1/4” PTF, 1/2” PTF, and 3/4” PTF port sizes the Excelon series is suitable for most general purpose applications.

**MINIATURE SERIES, GENERAL PURPOSE**

Ideal for applications where space is limited the miniature series can be ordered as pre-assembled units that give you complete control of your air preparation at a single point. Featuring port sizes of 1/8” PTF and 1/4” PTF this range is suitable for most general purpose pneumatic applications.
MAINLINE SERIES UNITS

General purpose filters and pilot operated regulators available in 1-1/2" PTF and 2" PTF port sizes.

- General purpose filters F17
  1/8" to 1-1/2" PTF
- General purpose filters F18
  1/8" and 2" PTF
- Coalescing filter F46
  3/8", 1", 1-1/4" PTF
- Regulators R17
  3/8" to and 1-1/2" PTF
- Pilot operated regulators R18
  1-1/2" and 2" PTF
- Lubricators L17
  1/4" to 1-1/2" PTF

SPECIAL PURPOSE

Featuring high flow pressure regulators, precision pressure regulators and gauges this range of special purpose products deliver long life times and port sizes.

- ‘Micro Trol’ special purpose pressure regulators R24
  1/8" to 1-1/4" PTF
- Precision regulators 11-002 and 20AG
  1/4" to 1" PTF
- Pilot operated pressure regulator 11-808, 11-042
  1/2" to 1-1/4" PTF
- Conventional and Feedback pilot regulators R40, R41
  1/4" PTF
- Pilot operated regulators 20-AL, 11-400, 11-104
  1/4" PTF
- Precision pressure regulator 11-018, R27
  1/4" PTF

STAINLESS STEEL – GENERAL PURPOSE AND PRECISION

General purpose and precision – ideal for use in applications that are harsh, this range of stainless steel products offers regulators, filters, filter/regulators and pressure regulators. Designed and manufactured to meet the NACE recommendations they are suitable for applications including food processing, marine, dental etc.

- Precision regulator, nd filter/regulator R38, B38
  1/8" PTF
- General purpose filter/regulator B38
  1/8" PTF
- Filters, pressure regulators, lubricators F22, R22, L22
  1/2" PTF
- General purpose regulators & filter-regulator R05, B05
  1/4" PTF

COMPRESSED AIR, WATER, AND BEVERAGE

A range of water regulators, U.L. approved regulators, and additional products to complete your system.

- Water pressure regulator R06
  1/8" and 1/4" PTF
- Water/air regulator R06
  1/8" and 1/4" PTF
- Water regulator R91
  1/4" PTF
- Water regulators R43, 11 009
  1/4", 3/8", and 1/2" PTF
- U.L. listed industrial service regulators R44
  1/4" PTF
- U.L. listed beverage regulators R81, R82, R83, R84
  1/4" PTF
- Relief valves 16-004
  1/8", 1/4" PTF
- Drip leg drain 17-016
  1/8", 1/4" PTF
- Gauges 18-013
  1/8", and 1/2" PTF
- Blow guns BG Series
  1/4" PTF
Coalescing Filter
Model No.
F92C-6ED-AT9 (3/8” PIF)
F92C-2AD-AT9 (1/4” PTF)

Combination Unit
Model No.
BL92-K31E (3/8” PIF)
BL92-231A (1/4” PTF)

Combination Unit
Model No.
BL92-K35E (3/8” PIF)
BL92-235A (1/4” PTF)
No tools required. Norgren Excelon Pro FRL.

Select, insert, twist
To install the Norgren Excelon Pro, simply:
- Select the desired FRL combination
- Insert the connector
- Twist them together to connect.

It takes just seconds to create a fully-functioning, cost-competitive FRL that delivers breakthrough flow capacity, with an unprecedented maximum flow for such a compact product. In other words, the kind of performance you expect from Norgren – inventors of the FRL over 80 years ago.

Minimised leaks
Once the unit is assembled, integrated push-on fittings not only cut installation time but also minimize leak paths and reduce the unit’s overall footprint.

Specifications
Fluid: Compressed air or inert gas
Maximum pressure: All units: 175 PSI (12 bar)

Operating temperature:
-4°F to 125°F [-20°C to 52°C]
[please consult our Technical Service for use below 35°F [2°C]]
-4°F to 140°F [-20°C to 60°C] [units without bowl]

Materials
Body: PBT
Transparent Bowl: polycarbonate
Elastomers: neoprene and nitrite
Locking plates: ABS
End connectors: PBT
Threaded ports: brass
Quikconnect: PBT.

Accessories
Quikconnect. Part Number: 9210-50
1/4" Push-in Fitting (PIF) connector with mounting brackets.
Part Number: 9213KIT-6E
1/4" PTF Threaded connector without mounting brackets.
Part Number: 9212KIT-2A

Ordering information

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Part number 1/4” PTF threads</th>
<th>Part number 1/4” PIF threads</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Purpose filter</td>
<td>F92G 2AN QT1</td>
<td>F92G 4EN QT1</td>
<td>Manual drain</td>
</tr>
<tr>
<td></td>
<td>F92G 2AN AT1</td>
<td>F92G 4EN AT1</td>
<td>Auto drain</td>
</tr>
</tbody>
</table>

Coalescing filter
- F92C 2AD AT0
- F92C 4ED AT0
- Auto drain, with pressure drop indicator

Regulator with gauge
- F92G 2AK RMG
- R92G 4EK RMG
- 4.3 to 145 psi

Filter/Regulator with gauge
- B92G 2AK QT1 RMG
- B92G 4EK QT1 RMG
- 4.3 to 145 psi (manual drain)
- 4.3 to 145 psi (automatic drain)

Shut-off valve
- T92T 2AN B1N
- T92T 4EN B1N
- 3/2 threaded exhaust

Combination unit with auto drain
- BL92-211A
- BL92-J11E
- Shut-off valve, filter/regulator, and lubricator

Combination unit with manual drain
- BL92-231A
- BL92-J31E
- Shut-off valve, filter/regulator, and lubricator

Directional control valve
- P92C 2AT PFA
- P92C 4ET PFA
- 24 volt solenoid operated with DIN connector

Smooth start
- P92E 2AN NNN
- P92E 4EN NNN
- Adjustable smooth start valve
Tried, tested, top quality accessories

Norgren air preparation accessories are designed and manufactured to the same high standards as all Norgren products, to work more efficiently, last longer, and save you time, trouble and money.

Gauges
Knowing the pressure in your compressed air system is essential for optimum efficiency. This selection of high quality, reliable pressure gauges – in a choice of pressure ranges – makes it easy for you to clearly see the pressure in the system at any time. The gauges can be direct or panel-mounted. Made in steel and plastic as standard, with four stainless steel versions also available.

Drip Leg Drain
This fully automatic unit drains liquid from low points in compressed air systems, so that collected liquids can be piped away. A built-in vent valve allows pressure to be safely vented before routine maintenance is carried out. Norgren recommends fitting a ball type Shut-Off Valve in front of a Drip Leg Drain unit, to facilitate on-site servicing. Polycarbonate bowl as standard. Optional zinc alloy bowl also available.

Service Kits
In order to keep your pneumatic components operating in tip top condition ensure that you change your seals provided in our Service Kits.

Norgren completes the job
If you’ve chosen Norgren for your airline system equipment, why not complete the job with Norgren tubing? Norgren Nylon and Polyurethane tubing offers industry-leading flexibility.

Norgren Nylon and Polyurethane Tubing
Supplied in 100 ft. rolls in cartons for protection and easy storage.
- For general industrial applications
- Light stabilized
- Available in sizes from 1/8" O/D to 1/2" O/D

Nylon tubing
Ø 1/8" to 1/2"

Polyurethane tubing
Ø 1/8" to 3/8"

Polyethylene tubine
(LDPE)
Ø 1/8" to 1/2"
Get the part quicker.  
Get the job done faster.

Ordering online with Norgren Express is the quickest and easiest way to get the product or part you need, when you need it.

ONLINE ORDERING IN 3 EASY STEPS

1 FIND
Find the product you need in minutes, from over 10,000 catalogue stocked products. All it takes is part or all of the part number. Or search the detailed product information pages.

2 SELECT
Select precisely the right product based on detailed technical information, datasheets, CAD drawings, price and availability, all easily accessible on each page.

3 BUY
Buy up to 10 items with one click using Quickbasket. Or copy large lists of items directly from your purchasing system, spreadsheet, email or Word document directly into Pastebasket. Order securely online 24/7.

When you need it fast.
The best solution – whichever way you buy it. Norgren Excelon.

Norgren invented the lubricator back in 1927. So when you choose products from the Norgren Excelon Modular System, you are also choosing over 80 years of design innovation and improvement, and an established reputation for reliability and cost-effectiveness. And with individual products or complete, ready-assembled boxed sets, the choice is yours.

If you need only one specific part for your airline, you’ll find it in the Excelon Plug-In System range:

- General purpose filters – For effective liquid removal and positive solid filtration. A large filter element area ensures minimum pressure drop.
- High-efficiency oil removal filters – High-efficiency coalescing filters which remove sub-micron particles and convert oil and water mist to liquid form for draining off. A service indicator is built-in.
- High efficiency oil vapor removal filters – Featuring an active carbon pack, these filters also help remove hydrocarbon gases and odors.
- Pressure regulators – The diaphragm and balanced valve design of these regulators helps to ensure excellent regulation characteristics. The non-rising adjusting knob has a snap-action lock.
- Filter/regulators – For high-efficiency water removal, and offering excellent regulation characteristics. Fitted with a non-rising adjusting knob with a snap-action lock.
- Lubricators – Micro-fog lubricators for general purpose pneumatic applications offer highly effective lubrication.
- Soft start/dump valves – Designed to provide a controlled increase of downstream pressure on start-up. Available as solenoid, air pilot or manual operation configurations, and offering high forward flow capacity and high flow dump facility.
- Pressure relief valves – Sensitive, accurate and with high relief capacity, these valves protect compressed air systems from over-pressurisation.

Alternatively, if you’re looking for a complete ready-to-go assembly – for process control or monitoring, start-up, machine control or a general pneumatic system – a Norgren Excelon Series air preparation boxed set has all the elements you need for an efficient airline, comprising:

- Filter – lengthens system life
- Regulator – ensures optimum pressure
- Lubricator – extends system life by up to 400%
- Shut-off valve – enables system isolation
- Pre-assembled wall brackets – enables mounting straight out of the box and prevents sagging pipes which can lead to leaks
**10 good reasons to choose Norgren Excelon**

| 1 | MODULAR UNITS  
Customize for your specific application |
| 2 | QUICK-CONNECT CLAMP SYSTEM  
Quick and easy assembly without loose parts |
| 3 | BAYONET BOWLS  
Easily removed for maintenance |
| 4 | UNIQUE PRISOMATIC SIGHT GLASS  
Changes colour when service required |
| 5 | CAPTIVE ‘O’ RINGS  
Easily assembled, with no loose parts |
| 6 | SOFT START DUMP VALVES  
Provide controlled increase in pressure on start up |
| 7 | SHUT-OFF VALVE  
Easy-to-operate exhausting slide valve |
| 8 | TAMPER-PROOF CAP  
Prevents unauthorised pressure adjustment |
| 9 | PORTING BLOCK MOUNTED PRESSURE SWITCH  
Provides feedback to monitoring systems |
| 10 | YOU CAN ORDER NOW  
For quick delivery from store.norgren.com |

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**BE PREP-AIR-ED**

The visual warning provided by the color change of a vapor removal carbon pack can tell you more than just that the vapor removal filter needs replacing.

When the white ring around the base of the carbon pack turns blue (or pink in older units) it is a sign that the media can no longer adsorb oil vapors, and they are passing through the element. When this happens, the vapor removal filter needs to be replaced as soon as possible. However, if the color change occurs soon after the filter has been installed, it may be indicating that the coalescing filter needs to be serviced—which involves replacing the element and fitting new seals. Or alternatively, the color change could be a sign of problems in the compressor.

This visual warning is a useful additional monitor of the status of your airline, but it should never take the place of scheduled maintenance.
Avoid cracking up. Norgren Stainless Steel products.

Some of the environments in which airline equipment is expected to work are not just difficult: they’re positively hostile. Others are not just clean, but spotless, and the airline equipment used within them has to be the same. In both cases, the solution is Norgren Stainless Steel airline products.

Environments which range from the simply demanding, to the hygienically clean, to the corrosive, all require very special qualities from their airline components. In pharmaceutical, food processing, medical, dental, marine, petrochemical and offshore industries, components must be resistant to corrosive chemicals or atmospheres, or able to be washed down to a high level of cleanliness, or both.

Norgren Stainless Steel products meet all the specifications, and with a range of filters, regulators, filter and pressure regulators, and lubricators, you can create a complete airline system which can take whatever your application throws at it, from one end of the system to the other.

**Military standards**

For example, the metallic parts in many of the Norgren Stainless Steel products meet the NACE Standard MR-01-75.

This standard, established by the National Association of Corrosion Engineers, is the recognized oilfield recommendation for resistance to sulphide stress cracking, which is common in well-head and other corrosive environments. In addition, some products in the range are Lloyds Register Type Approved for even greater peace of mind when used in your application.

Perhaps the ultimate recommendation and proof of the ruggedness and corrosion resistance of products in the Norgren Stainless Steel range is the fact that some even meet certain requirements of military specifications, namely: MIL-S-901C (Navy) 15 Jan 1963: Military Specifications Shock Test H.I. (High Impact); Shipboard Machinery, Equipment and Systems, and MIL-STD-167-1 (Ships) Military Standard Mechanical Vibrations of Shipboard Equipment.

So when your application is a battle against the elements or the working environment, you can be sure that Norgren can help you win.
# Ordering information

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>FILTER REGULATOR</th>
<th>PRECISION REGULATOR</th>
<th>PRECISION FILTER REGULATOR</th>
<th>PRECISION FILTER REGULATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
<td>B05-233-M1LA</td>
<td>R38-240-RNKA</td>
<td>B38-240-B1KA</td>
<td>B38-440-M1LA</td>
</tr>
<tr>
<td>Medium</td>
<td>Compressed air</td>
<td>Compressed air only</td>
<td>Compressed air only</td>
<td>Compressed air only</td>
</tr>
<tr>
<td>Maximum inlet pressure</td>
<td>300 psi (20 bar)</td>
<td>450 psi (31 bar)</td>
<td>450 psi (31 bar)</td>
<td>450 psi (31 bar)</td>
</tr>
<tr>
<td>Port size</td>
<td>1/4” PTF</td>
<td>1/4” PTF</td>
<td>1/4” PTF</td>
<td>1/2” PTF</td>
</tr>
<tr>
<td>Gauge port</td>
<td>1/4” PTF</td>
<td>1/4” PTF</td>
<td>1/4” PTF</td>
<td>1/4” PTF</td>
</tr>
<tr>
<td>Pressure range</td>
<td>to 300 psi</td>
<td>3.6 to 101 psi</td>
<td>3.6 to 101 psi</td>
<td>4 to 130 psi</td>
</tr>
<tr>
<td>Ambivalent temperature</td>
<td>-13F to 175F</td>
<td>-40°F to 176°F</td>
<td>-40°F to 176°F</td>
<td>-40°F to 176°F</td>
</tr>
</tbody>
</table>

When you need it fast.
Air may be free, but compressed air isn’t. In fact, it can be 10 times as expensive as electricity when you take into account all the generation, transmission, treatment and system costs. So it’s essential to make sure the compressed air you use is as cost-effective as it can be.

When air leaves a compressor it is hot, dirty and wet – and also usually at a higher pressure than required by the equipment downstream.

How dirty and how wet? A typical 100 scfm (50 dm³/sec) compressor will push 1180 gals. (4,500 liters) of water and 2 gal. (8 liters) of degraded compressor oil into the airline system in a year, not to mention countless particles of dirt. If any of that gets into the equipment being powered, it will make it run less efficiently, work less effectively, and wear out or break down much sooner.

So compressed air must be thoroughly treated to remove contaminants and reduce the pressure, and also often needs clean oil added to lubricate the equipment it is powering.
Cleaning the air
Liquid water, water vapor, solid particles and oil all need to be removed from the air when it leaves the compressor.

Water vapor originates at the compressor outlet but as the air cools it also turns to liquid – and needs to be removed in both forms. Solid particles can get into the air from the atmosphere, corrosion or carbon products, or from the mechanical fixing of the metal pipe work and system components. Some equipment – such as air bearings and miniature pneumatic motors – will need very fine filtration to remove them.

Oil is present in liquid, aerosol and vapor forms. Using oil-free compressors is an option, but otherwise standard filters, coalescing filters and vapor removal filters may be required. Some applications can operate with a certain amount of oil vapor or aerosol contamination, and Norgren can advise on your best options.

Additional downstream filters can then clean the air further for specific use in particular parts of the plant or the process.

Controlling the pressure
Using pneumatic equipment at a higher pressure than specified causes excessive wear, with no significant increase in output. At the same time the compressed air and the energy used to generate it are wasted.

The cost-saving solution is a pressure reducing valve or a regulator (general purpose, pilot operated, precision, or special purpose), which keeps the outlet pressure constant irrespective of inlet pressure and outlet flow.

Adding lubrication
Finally, a suitable amount of lubricant has to be added, to reduce resistance and wear in the operating equipment: Norgren invented the aerosol lubricator – the most commonly used – but also offers the injection pump type, and can advise on the most appropriate for your equipment and application.

All the knowledge, all the products
As the world leader in air preparation Norgren has unrivalled knowledge of the best ways for you to produce clean compressed air, and to use it economically, effectively and safely. And wherever you need compressed air – whether in a simple factory installation, a complex medical application or something in-between – Norgren has the products to meet your needs.
Airline Accessories

Once you’ve chosen Norgren for your airline system equipment, why not complete the job with quality Norgren accessories. From mufflers, to function fittings, to tubing, Norgren offers the products to complete your airline system.

**MUFFLERS, SILENCERS, AND BREATHER VENTS**

- MS series: Sintered bronze silencers
- Quietaire: Heavy duty mufflers
- C/S series: Porous plastic mufflers
- Breather vents
- Stem silencers
- T20 series: High performance flow control muffler

**FUNCTION FITTINGS AND FLOW CONTROLS**

- Banjo flow controls
- MQ series: Plastic speed control
- Sintered bronze speed control
- T51, T52, and T53 series: Push-in non-return valves
- T55, and T56 series: Non-return valves
- M/800 series: Heavy duty flow controls, uni-directional

- T15 series: Push-in flow controls, uni-directional
- T1000 series: Black form flow controls
- T60 series: In-line excess flow shut-off valves
- T65 series: Shuttle valves
- T70 series: Quick exhaust valves
- M/800 series: Heavy duty flow controls, uni-directional

**TUBING AND ACCESSORIES**

- Nylon tubing Ø 1/8” to 1/2”
- Polyurethane tubing Ø 1/8” to 3/8”
- Polyethylene tube (LDPE) Ø 1/8” to 1/2”
- Tube cutter
- Tubing mount Ø 1/4” to 1/2”

Visit NorgrenExpress.com Call 1.800.959.2504
“Yes, we have your fitting.”

Contact Norgren Express for a fitting and you can be almost certain we’ll say yes, yes, and yes again. Because we have a range of over 10,000 different shapes and sizes, making us probably the supplier with the most comprehensive range available.

Norgren fittings work seamlessly with virtually every motion and fluid control product you can think of – making Norgren Express the only place you need to go for all the fittings you could ever need.

So whether you want:
- General purpose industrial fittings
- Heavy duty push-in fittings
- Push-on fittings for vacuum applications or
- Compression fittings for high pressure, rugged and aggressive environments...

...Norgren fits the bill.

To see the complete range, or find the fitting you want – fast – visit NorgrenExpress.com now.
Be rewarded for being prep-air-ed. Give us your best pneumatics tip, and we’ll give you a FREE gift in return.

Go to http://programs.norgren.com/toptip to send us your top pneumatics tip. We’ll pick the best one every quarter – and if it’s yours you can look forward to a great prize in return!

The general purpose filter, the coalescing oil removal filter and the activated carbon filter.

Three main types of filters exist: the general purpose filter for water and particles, the coalescing oil removal filter for oil aerosols, and the activated carbon filter for the removal of oil vapors. Use general purpose filters for main headers, branch lines, tools, cylinders, valves and valve circuits, air agitators, packaging machines, etc. Use oil removal filters when sub-micron cleanliness or oil-free air is required, such as for the supply to fluidic devices, painting or coating processes, instrumentation, air gauging equipment, air bearings, and medical applications or areas where typical synthetic compressor oils may damage commonly used Buna rubber such as non-lubricated power circuits. Finally, use activated carbon filters for systems where the oil vapors in the air are not acceptable, such as instrumentation, medical, or packaging systems where the compressed air may come into contact with the product, such as pharmaceuticals.
Want your own Norgren Express Catalog?

Request a catalog today and we’ll post it out straightaway

The Norgren Express Catalog is your guide to all things Norgren, and an invaluable reference that in your job you simply can’t afford to be without.

Our 170 full-color catalog features all products in the Norgren Express offering, with technical data, related accessories, and useful Express Plus tips to help you choose the right products and parts for your airline system.

And to make it quick and easy for you to go straight to the product you want, the Norgren Express Catalogue features a Fast Find Guide, to save you wasting valuable time flicking through the pages. Though with so many useful, money-saving, time-saving products and accessories to choose from, you might want to do that anyway.

Call 1.800.959.2504 now to request your free Norgren Express Catalog.

How to get in touch

For technical help and advice, please contact your local Technical Sales Center at 1.800.959.2504

For product information, literature downloads, and support, please visit www.norgren.com

For product purchases, please visit Norgren Express.com
General & Airline Equipment
Pneumatic Symbols

Airline Equipment & Accessories
Pneumatic Symbols

Compressor

Exhaust port in a component with no means of connection
Exhaust port in a component with means of connection
Exhaust port in a component fitted with a silencer

Water separator with manual drain
Water separator with automatic drain
Filter with manual drain

Filter with auto drain
Lubricator
Cooler

Direction of flow pneumatic and hydraulic
Rotary connection of one or more lines

Working line
Pilot line
Enclosure line

Junctions

Dryer
Pressure regulator with gauge
FRL with pressure gauge
FRL with pressure gauge simplified

Pressure relief valve preset
Pressure relief valve adjustable
Non return valve
Pressure to electric swith preset
Shuttle valve ‘OR’
Shuttle valve ‘AND’
Quick exhaust valve fitted with silencer
Flow regulator
Flow regulator uni-directional