

# Industrial Automation

IMI Norgren

ISO Standard Cylinders  
High performance cylinders  
for any application



Breakthrough  
engineering for  
a better world

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# 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.



# ISO Standard Cylinders

Our market leading range of ISO standard cylinders has been proven in the market over many years and in the most challenging environments. Backed by our standard warranty the range comes in 11 different bore sizes and offers stroke lengths of up to 3 metres.

Running costs and total cost of ownership can be optimised using our low friction levels to operate at lower air pressures. In addition to our standard range, we offer up to 28 variants such as non-rotating, four position and alternative seal materials. Our extensive range of accessories includes reed and solid state switches and one of the largest ranges of mountings on the market.

Standard cylinders and mountings are available for immediate dispatch with many of the non-standard options manufactured within 24 hours.

## Our ISO standard cylinder ranges conform to the following international standards:

- ISO 15552
- ISO 6431
- VDMA 24562
- NFE 49-003-1





## Product Highlights:

- **Reliability** – our ISO standard cylinders have been proven over many years and in the most challenging environments. To demonstrate our confidence in our products, they are backed by our standard warranty.
- **Choice** – our range comes in bore sizes of Ø32 to 320mm and in strokes of up to 3 metres. This gives more scope for using the products in the widest range of applications.
- **Options** – we are able to offer up to 28 variants including non-rotating, four position and alternative seal materials. These options allow customisation to solve the most difficult actuation problems.
- **Accessories** – includes reed and solid state switches, one of the widest range of mountings on the market and a choice of functional fittings. Solutions can be configured to give additional functionality and efficient operation.
- **Availability** – standard cylinders and mountings are available for immediate dispatch with many of the non-standard options manufactured within 24 hours. Essential for breakdowns or where customers require short lead times to meet their own delivery requirements.





# Introducing ISOLine™

- Comprehensive range for the utmost versatility
- Cylinders and mountings that conform to ISO 15552
- All sizes supplied magnetic as standard
- Polyurethane seals ensure efficient low friction operation and long life

## Incorporating the IMI Norgren Adaptive Cushioning System (ACS)

Our cushioning system will automatically adapt to an application without the need for any adjustment of the cushion screw. This removes the need for specialist knowledge for set-up and simplifies installation. Also, the ACS will adjust to any changes in the application, such as varying loads, which may occur over a cylinder cycle, a working shift or the life of the machine. This will help to ensure the application always runs efficiently and potentially extend the servicing period of the machine.

For extreme applications involving high speeds or heavy loads, a cushion screw is included for manual adjustment if required.

### ISOLine™ P PRA/802000

- Ø32 -125mm
- Profile barrel
- Clean appearance
- Protection against ingress
- Flush mounted reed and solid state switches available for position sensing

### ISOLine™ R RA/802000

- Ø32 -125mm\*
- Robust construction
- Suitable for more aggressive environments
- Reed and solid state switches available for position sensing
- External tie rod construction

### ISOLine™ F1 PSA/802000/F1

- Ø40 -125mm
- Profile barrel
- With integral potentiometer
- Position sensing over complete stroke
- IP67 ingress protection

### ISOLine™ Stainless Steel KA/802000

- Ø32 - 200mm
- Robust construction
- Suitable for heavy wash-down environments
- Reed and solid state switches available for position sensing
- 303, 304 and 316 stainless steel tie-rod construction

\* Standard ISO RA/8000 cylinders available up to Ø320mm



### Adaptive Cushioning System (ACS)

- No cushioning setting required, cylinder auto-adapts to application
- Fit & Forget

### Improved performance

- Operates at low pressures with very low leakage

### Wide range of applications

- Heavy industrial to clean food & beverage to rail and truck



### Modern appearance

- Looks great
- Smooth end covers contoured to barrel for easy cleaning

### Reduced weight

- Lower overall weight of machine
- Reduced transport costs

### Additional switch mounting

- Great flexibility for machine designers



# The ISO Standard Range

Our full range of ISO standard cylinders offers a cylinder for any application:

## Industrial Cylinders

### ISOLine™ P

PRA/802000

This cylinder's shaped profile barrel provides a clean appearance and enables direct assembly for flush-mounted switches.

### ISOLine™ R

RA/802000

This cylinder is of robust tie-rod construction, ideal for industrial applications. Available in all bore sizes with a wide choice of variants, options, and mountings, it can be adapted to solve the most difficult actuation challenges.

### ISOLine™ F1

PSA/802000/F1

A potentiometer is incorporated into this cylinder which gives accurate feedback on the position of the piston.

The output is proportional to the stroke length enabling the cylinder to be used as part of a positioning system.

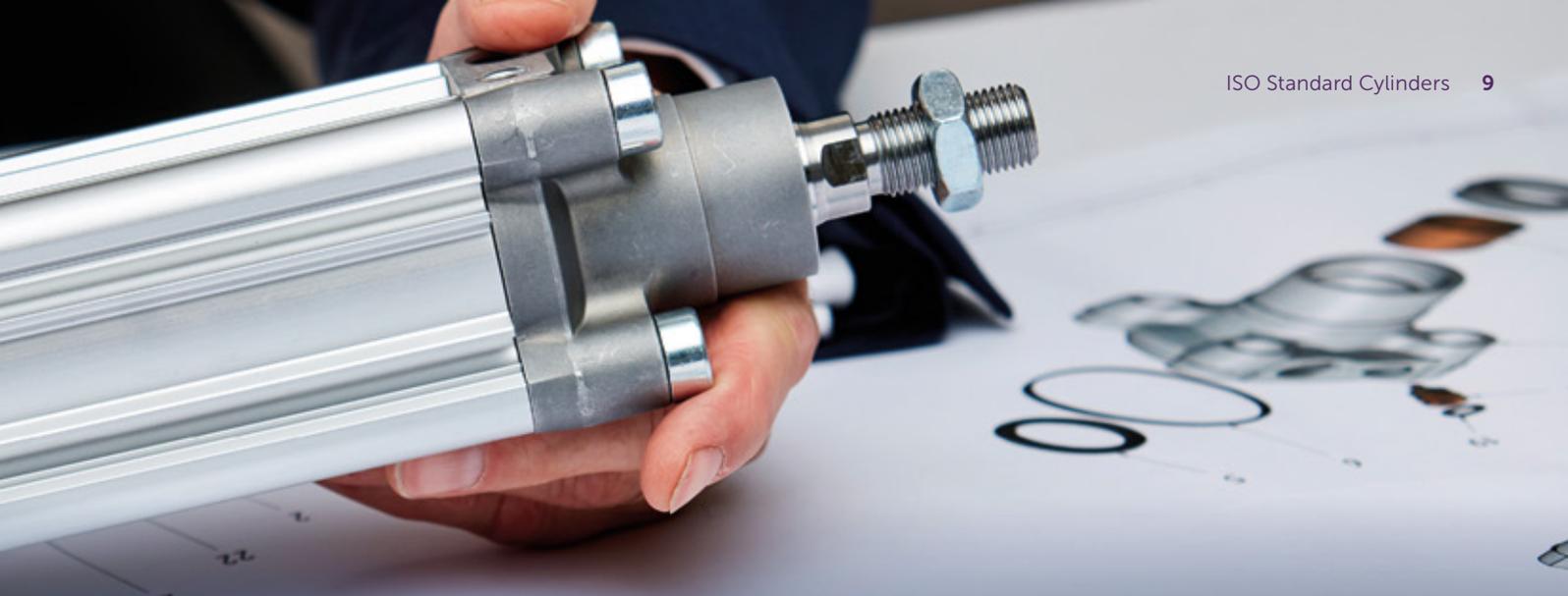
### IVAC Industrial

PRA/862000

IVAC incorporates proven valve and flow regulation technologies to reduce energy consumption, weight and installation space.

Anodised end covers give additional environmental Protection, and ATEX versions are available for hazardous applications.





From -40°C to  
+150°C



From 5mm to  
2800mm stroke



From 32mm to  
320mm bore



From 0.1mm/second  
to 3000mm/second



From heavy industrial to  
clean food and beverage to  
corrosive environments

## Cleanline Cylinders

### ISOLine™ Stainless Steel

KA/802000

The most rugged and reliable cylinder for applications in harsh environments and where contact with food requires heavy washdown.

It is constructed from AISI 303, 304 and 316 and complemented with a range of mountings.

### Smoothline

PRA/822000

The anodised barrel and end covers, and option of single rear air connection, give this cylinder its smooth profile. Switches can be directly flush-mounted to maintain its appearance.

### Cleanline

PRA/842000

This cylinder is hygienically designed according to EN1672-2 with an IP67 protection class for washdown in packaging and food applications.

### IVAC Cleanline

PRA/882000

The pilot valve module maintains the IP67 protection class of the cleanline variant. Customer installation is greatly simplified, with a single M12 connector for the pilot valves and switches, and single air and exhaust ports.



# ISO Standard Cylinder Variants

ISO standard cylinders offer complete flexibility for many industrial applications. We are able to offer up to 28 different variants, including:

Female Thread		Female threaded option available where space is a premium.
Non-rotating		A non-rotating piston rod ensures external load is guided.
Bellows		Bellows protect the piston rod from aggressive materials and environments.
Double Ended		Two rodged cylinder allows movement of two loads in one stroke.
Four-Position		Back to back mounted cylinders provide multiple positioning.
Locking Unit		A passive locking unit will retain the piston rod in position until released by an air signal.
Guide Blocks		Guide blocks allow higher external loads to be supported and prevent excessive forces being applied to the piston rod.
Guide Blocks		Guide blocks allow external loads to be supported and moved at higher speeds and greater accuracy.

# Specifications

Technical feature	Parameters	Industrial Cylinders				Cleanline Cylinders			
		ISOLine™ P	ISOLine™ R	ISOLine™ F1	IVAC Industrial	Smoothline	Cleanline	IVAC Cleanline	Stainless Steel
		PRA/802000	RA/802000	PSA/802000/F1	PRA/862000	PRA/822000	PRA/842000	PRA/882000	KA/802000
Cylinder diameters	32, 40, 50, 63, 80, 100, 125, 160, 200mm *	32 ... 125mm	32 ... 125mm	40 ... 125mm	32 ... 100mm	32 ... 100mm	32 ... 100mm	32 ... 100mm	32 ... 200mm
Standard strokes	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500mm	25 ... 500mm	25 ... 500mm	25 ... 500mm					
Non-standard strokes		10 ... 2800mm	10 ... 2800mm	10 ... 1000mm	25 ... 1000mm	10 ... 2000mm	10 ... 2000mm	25 ... 1000mm	10 ... 2500mm
Operating pressure	All cylinder diameters	1 - 12bar	1 ... 16bar	1 ... 12bar	2 ... 8bar	1 ... 10bar	1 ... 10bar	2 ... 8bar	1 ... 16bar
Operating temperature	All cylinder diameters	-20 ... +80°C	-20 ... +80°C	-20 ... +80°C	-5 ... +80°C	-20 ... +80°C	-20 ... +80°C	-2 ... +70°C	-20 ... +80°C
Voltage	Supply			0 ... 36V d.c.	24V d.c.			24V d.c.	
	Switching (if switches fitted)						10 ... 30V d.c.		
Electrical connection				M12 x 1 male 4 pin	DIN Form C		M12 x 1 male 4 pin	M12 x 1 male 8 pin	
Power consumption					2W max.			1W max.	
Rating				100% E.D.	100% E.D.			100% E.D.	
Protection class				IP67	IP65		IP67	IP67	
<b>Materials</b>									
Barrel	Anodised aluminium	*	*	*	*	*	*	*	
	Stainless steel (austenitic)								*
End covers	Aluminium	*	*	*					
	Anodised aluminium				*	*	*	*	
Piston rod	Stainless steel (austenitic)								*
	Stainless steel (martensitic)	*	*		*	*	*	*	
Piston seals	Ø32 ... 125mm	PUR	PUR	PUR	PUR	PUR	PUR	PUR	PUR
	Ø160 ... 200mm	NBR	NBR						NBR
Piston rod seal	All cylinder diameters	PUR	PUR	PUR	PUR	PUR	PUR	PUR	FKM

# Variants

Piston rod seal	Hard chrome plated	*	*		*	*	*	*	
	Stainless steel (austenitic)	*	*		*	*	*	*	
	Stainless steel (austenitic) hard chrome plated	*	*		*	*	*	*	
Non-magnetic					*	*		*	
Magnetic		*	*	*	*	*	*	*	
High temperature	150°C Max.	*	*			*		*	
Hydraulic		Ø32 ... 100mm	Ø32 ... 100mm						
Special rod seal		*	*		*	*	*	*	
Low friction		*	*						
Extended piston rod		*	*		*	*	*	*	
Piston rod bellows		*	*	*	*	*	*	*	
Without cushioning		*	*					*	
Double ended piston rod		*	*			*	*	*	
Four position cylinder		*	*			*	*		
Non-rotating piston rod		Ø32 ... 100mm	Ø32 ... 100mm						
With locking unit		*	*		*	*	*	*	

\* 160, 200, 250 and 320mm bore sizes are also available in tie-rod version – refer to RA/8000 data sheet N/en 1.5.125.01

# IVAC Innovation to Reduce Energy Usage and Operating Costs

## A unique & sustainable operational improvement

- Reduce operating costs
- Reduce components
- Simplify ordering, installation and maintenance
- Reduce machine downtime
- Ready for predictive maintenance with our M/50 IO-Link capable switch
- Cleanline versions for washdown applications

### Saves Air

Consolidation of parts and patent protected design reduces air consumption by minimising dead volume (it only uses the air in the cylinder, NOT the air in the tubing)

### Saves Cost

Reduced air means the cost per mm of stroke is significantly reduced (the air savings effectively pay for replacements)

### Saves Energy

By reducing air consumption and thereby the demand on your compressors, reduce the related energy costs. By reducing energy costs and related CO<sub>2</sub> emissions, IVAC helps towards meeting Energy targets and sustainability KPIs.

### Saves Time

Less components, wiring and tubing simplifies design and ordering and allows for quicker installation and commissioning



Integrated valve actuator control

Cut energy consumption by up to 50%

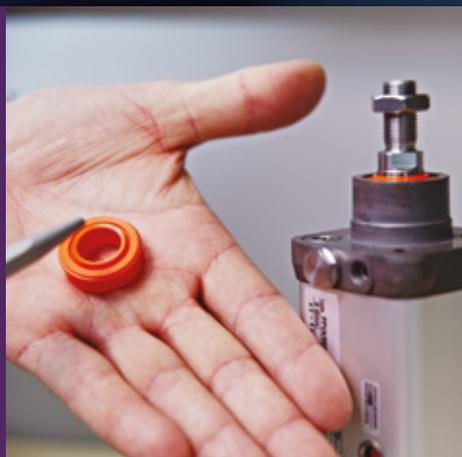


●● IVAC Industrial

IP65, integrated valve & flow controls for fast installation ●●

●● IVAC Cleanline

IP67, integrated valve, switches & flow controls for fast installation and easy washdown ●●



- Adjustable & buffer cushioning for end of stroke damping
- Fully integrated sensor adjustment
- 1 single M12 connection (IVAC Cleanline)
- Fully integrated flow controls

- 1 single air connection, 1 single exhaust port
- Integrated pressure protection
- Long life glandless valve technology
- ISO VDMA footprint

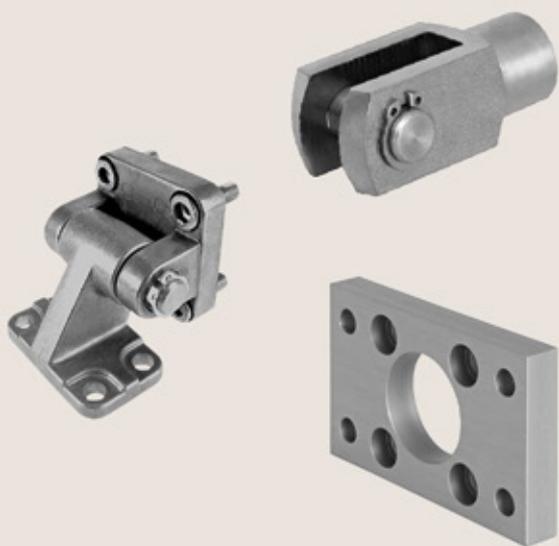
**Operating Life**

- Life expectation seals:  
Stroke < 100 mm: 10 Mio. Cycles  
Stroke > 100 mm: 5000 km
- Life expectation solenoid valves:  
50 Mio. Cycles

\* based on the technical specification in our data sheets

# Cylinder Mountings and Accessories

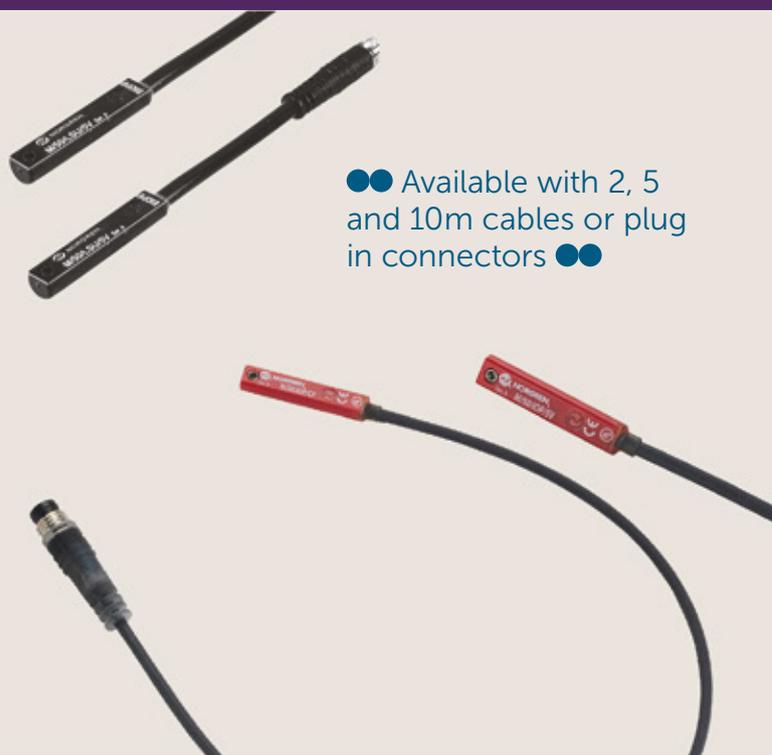
Our ISO standard cylinders are complemented by one of the largest ranges of accessories on the market, including mountings, switches and cables.



●● A mounting option for every application ●●

## Mountings

A comprehensive range of mountings for each cylinder range conforming to ISO15552 for front end cover, rear end cover and piston rod mounting.



●● Available with 2, 5 and 10m cables or plug in connectors ●●

## Switches

Reed, solid state and IO-Link switches are available which are suitable for all cylinder ranges with magnetic pistons.

Switches can be mounted flush on profile cylinders, or with the delivered adapter for tie-rod versions.

## Data Sheets

Range	Product	Data sheet
Industrial Cylinders	ISOLine™ P PRA/802000	N/en 1.5.220.01
	ISOLine™ R RA/802000	N/en 1.5.220.01
	ISOLine™ PSA/802000/F1 Industrial	N/en 1.9.067.01
	ISOLine™ PSA/802000/F1/EX ATEX	N/en 1.9.068.01
	IVAC Industrial PRA/862000	N/en 1.5.250.01
Cleanline Cylinders	Smoothline PRA/822000	N/en 1.5.230.01
	Cleanline PRA/842000	N/en 1.5.240.01
	IVAC Cleanline PRA/882000	N/en 1.5.260.01
	ISOLine™ Stainless Steel KA/802000	N/en 1.5.222.01
Switches	M/50 reed switches	N/en 4.3.005.01
	M/50 solid state switches	N/en 4.3.007.01
	M/50 IO-Link sensor	N/en 4.3.007.01

●● Full details of products and variants can be found in the product datasheets ●●

●● All the accessories you need to complete your installation ●●



### Connectors & cables

15mm Form C connectors are available for connecting to IVAC Industrial pilot solenoids.

M12 connector cables are available for connecting to Cleanline and IVAC Cleanline cylinders. A Y-connection cable is also available for configuring the cylinder to an I/O module.

### Functional fittings

Suitable for use on all actuator ranges. Function fittings can be used to achieve optimum actuator control.

- **Pneufit C fittings** – a range of composite push-in fittings for nylon and polyurethane tubing incorporating a releasable stainless steel grab ring for quick tube removal and nickel plated brass components for corrosion resistance and extended life.
- **Flow regulators** – a choice of adjustable general purpose and precision flow regulators can be directly connected to the actuator and provide speed control over the entire stroke length.
- **Functional fittings** – part of the Pneufit family, the range includes pilot operated check valves, which allow flow in one direction only when the pilot signal is removed; pressure reducing fittings, to provide secondary reduced pressure and prevent pressure build-up; and pneumatic sensor fittings, which produce an air signal when end of travel is reached.

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.

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# Industrial Automation

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