IMI NORGREN

ISO Standard Cylinders

High performance cylinders for any application

Engineering GREAT Solutions

IMI Precision Engineering

Contents

Innovation, products and service

Engineering GREAT solutions through people, products, innovation and service

IMI Precision Engineering is a world-leader in fluid and motion control. Building close, collaborative relationships with our customers, we gain a deep understanding of their engineering needs and then mobilise our resources and expertise to deliver distinctive products and solutions.

Wherever precision, speed and engineering reliability are essential, our global footprint, problem-solving capability and portfolio of high performance products enables us to deliver GREAT solutions which help customers tackle the world's most demanding engineering challenges.

> **Reliability**
We deliver and support our high quality products through our global service network.

> **High performance products**
Calling on a world-class portfolio of fluid and motion control products including IMI Norgren, IMI Buschjost, IMI FAS, IMI Herion and IMI Maxseal. We can supply these singly, or combined in powerful customised solutions to improve performance and productivity.

> **Partnership & Problem Solving**
We get closer to our customers to understand their exact challenges.

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

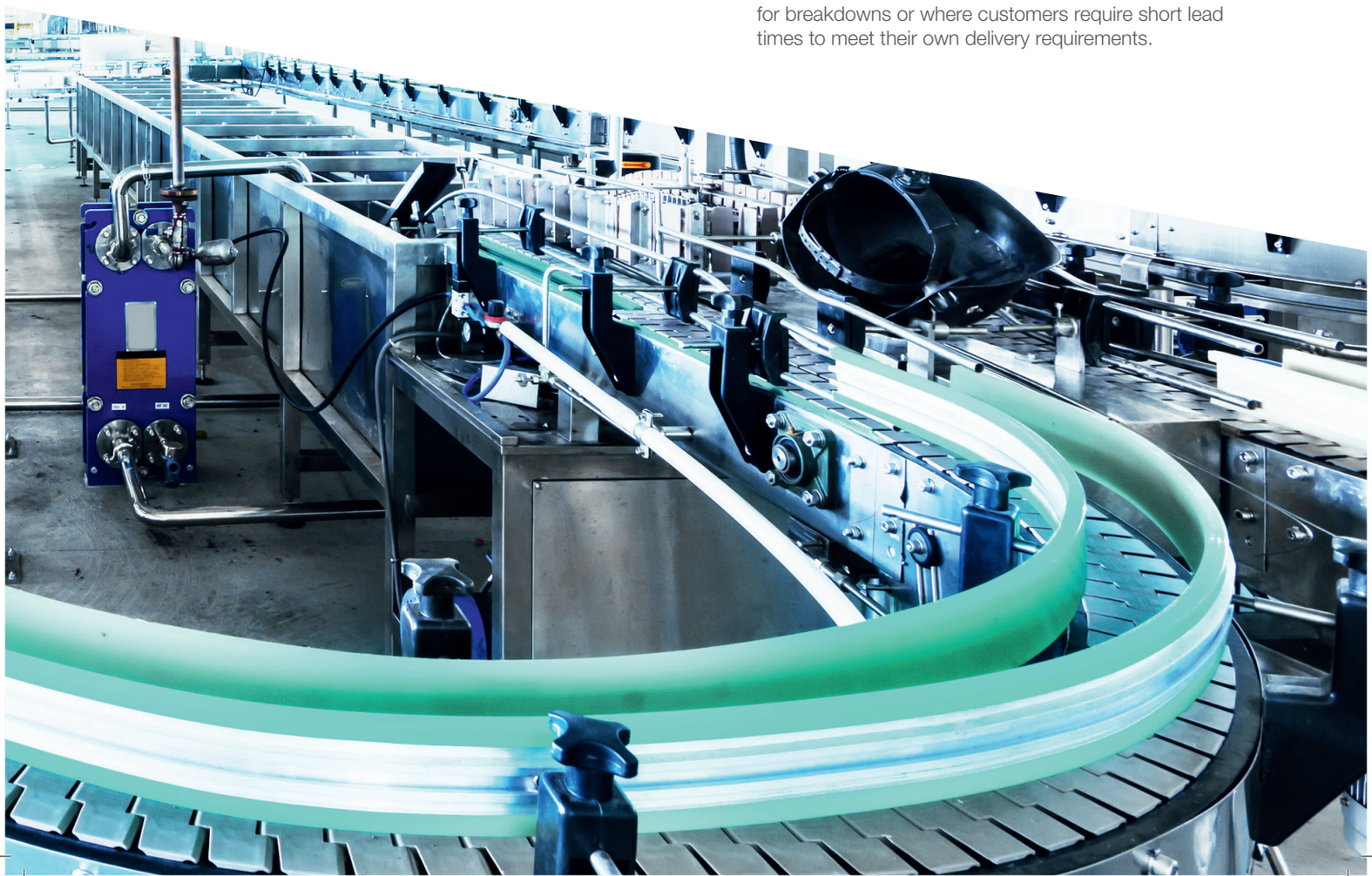
> **RELIABILITY** – our ISO standard cylinders have been proven over many years and in the most challenging environments. To demonstrate our confidence in our products, they are backed by IMI Precision Engineering's standard warranty.

> **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.



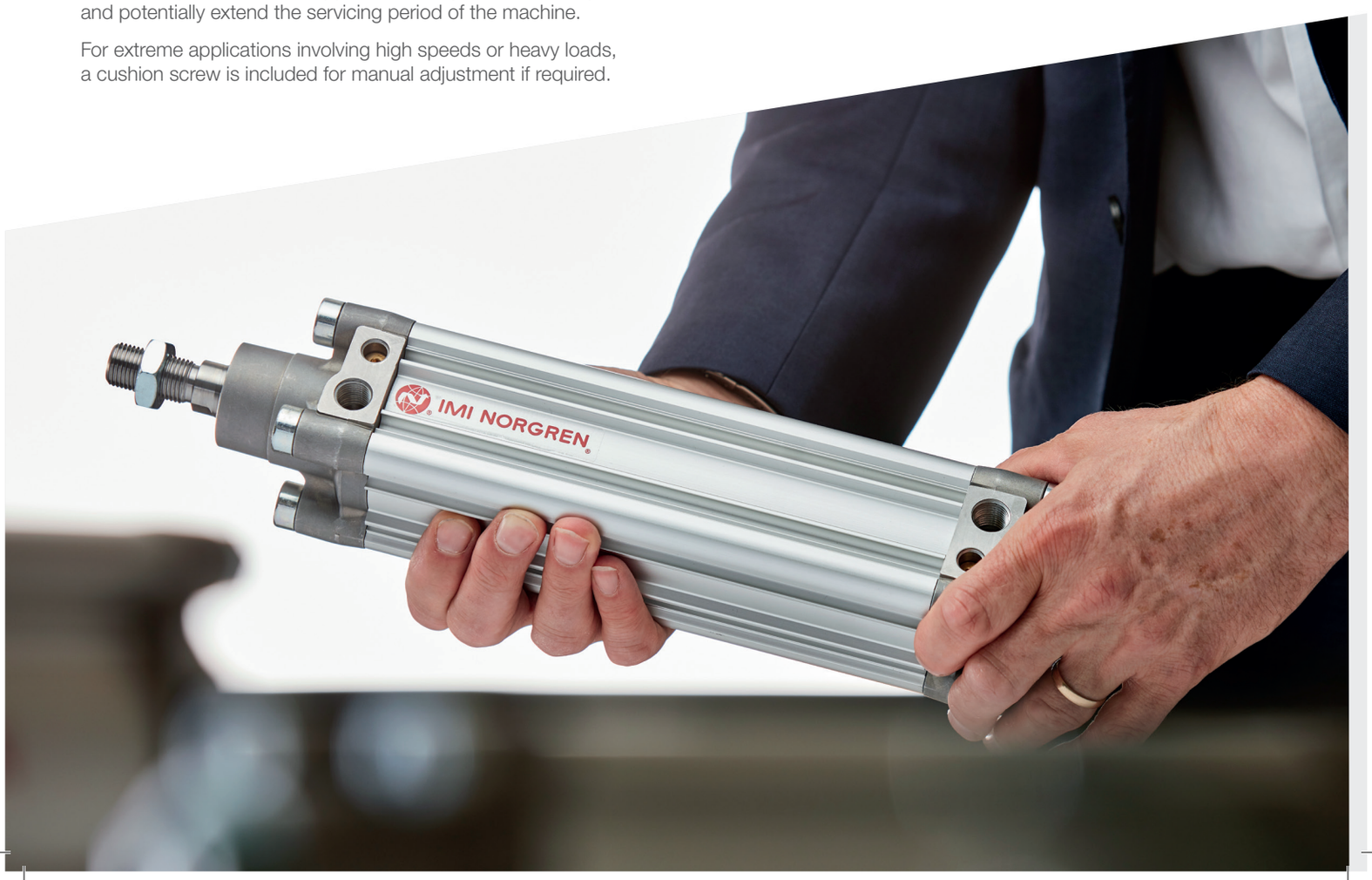
Introducing ISOLine™

- 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

Introducing 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

Adaptive Cushioning System (ACS)
- No cushioning setting required, cylinder auto-adapts to application
- Fit & Forget

Wide range of applications
- Heavy industrial to clean food & beverage to rail and truck

Improved performance
- Operates at low pressures with very low leakage

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:

> From heavy industrial to clean food and beverage to corrosive environments

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.

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

Cleanline Cylinders

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.

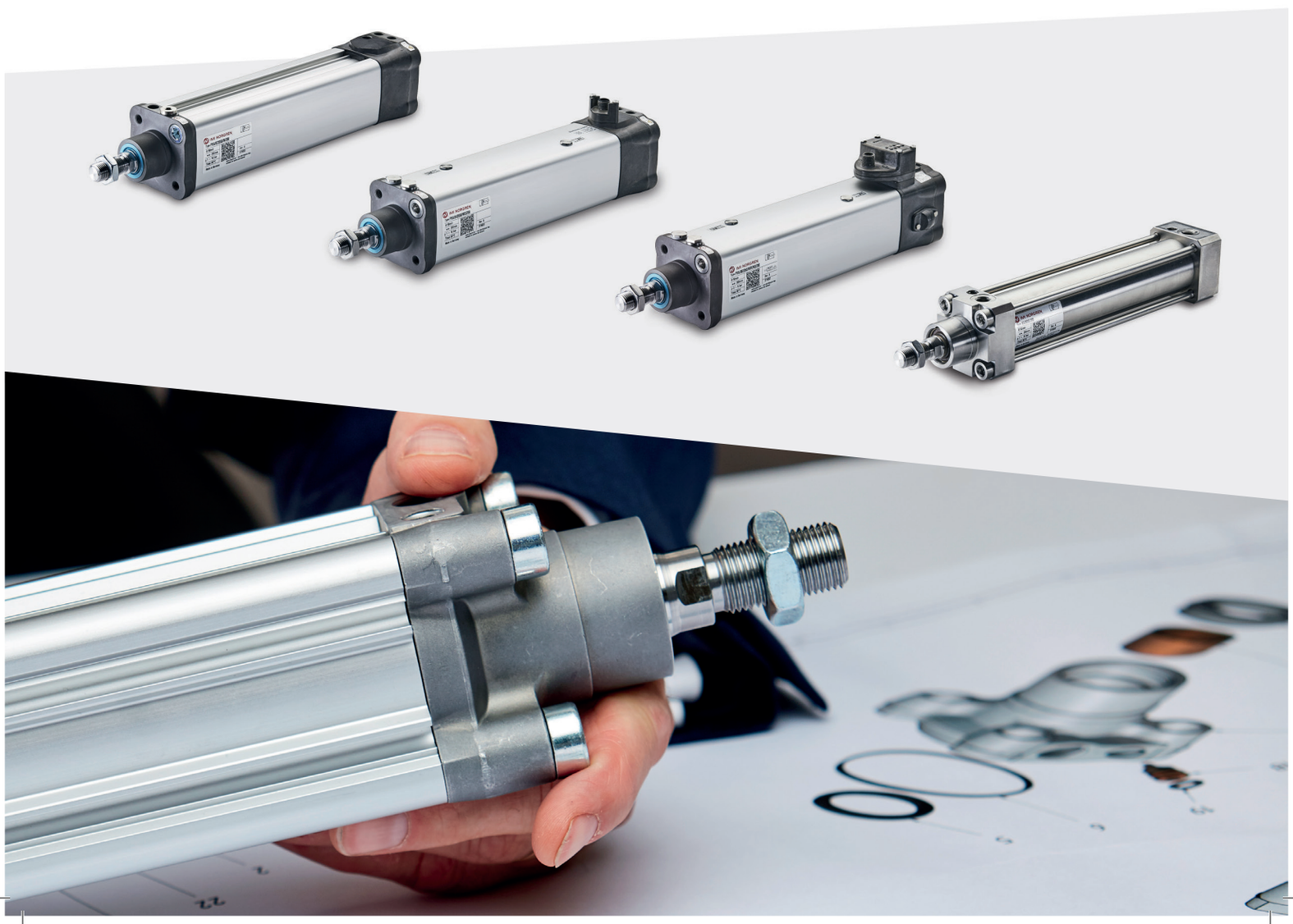
IVAC Cleanline
PRA/882000

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.

Stainless Steel
KA/8000

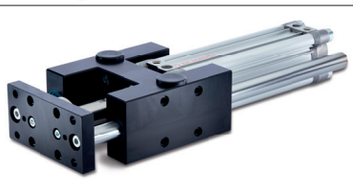
The most rugged and reliable cylinder for applications in harsh environments and where contact with food requires heavy washdown.

It is constructed from AISI303, 304 and 316 and complemented with a range of mountings.



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 rodded 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

		Industrial Cylinders			Cleanline Cylinders			
Technical feature	**Parameters**	**ISOLine™ P**	**ISOLine™ R**	**IVAC Industrial**	**Smoothline**	**Cleanline**	**IVAC Cleanline**	**Stainless Steel**
		PRA/802000	**RA/802000**	**PRA/862000**	**PRA/822000**	**PRA/842000**	**PRA/882000**	**KA/8000**
Cylinder diameters	32, 40, 50, 63, 80, 100, 125, 160, 200mm *	32 … 125mm	32 … 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					
Non-standard strokes		10 … 2800mm	10 … 2800mm	25 … 1000mm	10 … 2000mm	10 … 2000mm	25 … 1000mm	10 … 2500mm
Operating pressure	All cylinder diameters	1 - 12bar	1 … 16bar	2 … 8bar	1 … 10bar	1 … 10bar	2 … 8bar	1 … 16bar
Operating temperature	All cylinder diameters	-20 … +80°C	-20 … +80°C	-5 … +80°C	-20 … +80°C	-20 … +80°C	-2 … +70°C	-20 … +80°C
Voltage	Supply			24V d.c.			24V d.c.	
	Switching (if switches fitted)					10 … 30V d.c.		
Electrical connection				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.	
Protection class				IP65		IP67	IP67	
Materials								
Barrel	Anodised aluminium	*	*	*	*	*	*	
	Stainless steel (austenitic)							*
End covers	Aluminium	*	*					
	Anodised aluminium			*	*	*	*	
	Stainless steel (austenitic)							*
Piston rod	Stainless steel (martensitic)	*	*	*	*	*	*	
	Stainless steel (austenitic)							*
Piston seals	Ø32 … 125mm	PUR	PUR	PUR	PUR	PUR	PUR	PUR
	Ø160 ... 200mm	NBR	NBR					NBR
Piston rod seal	All cylinder diameters	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 energy improvement

- Reduce components
- Reduce operating costs
- Faster actuator response times
- Simplify ordering, installation and maintenance
- Cleanline versions
- Reduce machine downtime

Saves Energy

By reducing CO_2 emissions and KW Hrs, IVAC helps towards Energy targets & KPI's

Saves Cost

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

Saves Air

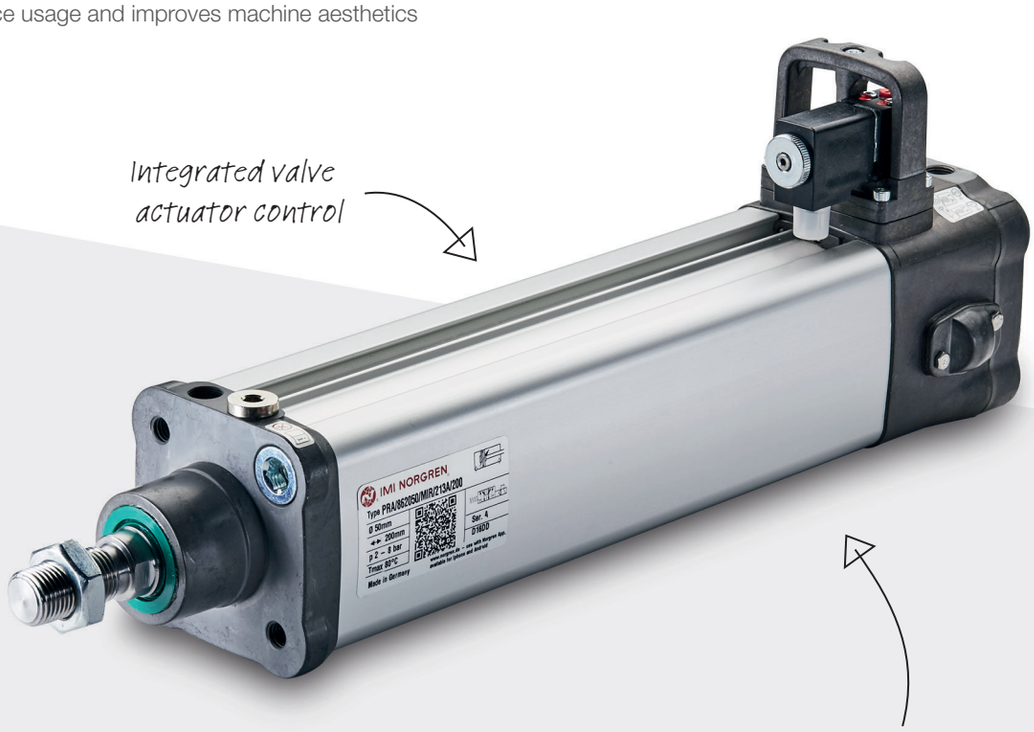
Consolidation of parts and patent protected design reduces energy consumption by minimising dead volume (it only uses the air in the cylinder, NOT the air in the tubing)

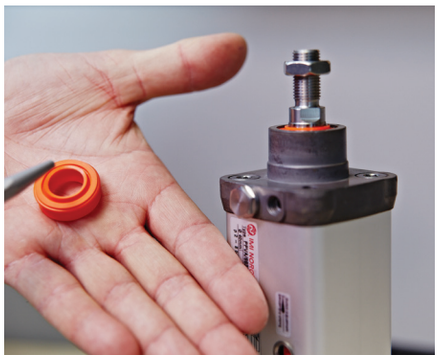
Saves Time

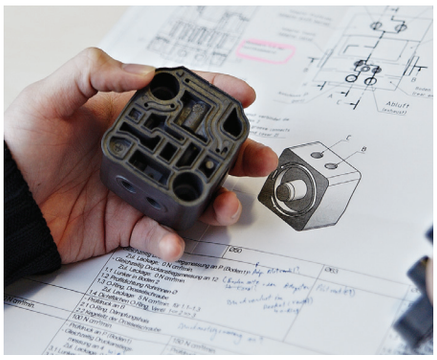
Simple selection and ordering with reduced installation and commissioning time

Saves Space

Optimises space usage and improves machine aesthetics







IVAC Cleanline

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

IVAC Industrial

IP65, integrated valve & flow controls for fast installation

- 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

Cylinder Mounting and Accessories

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

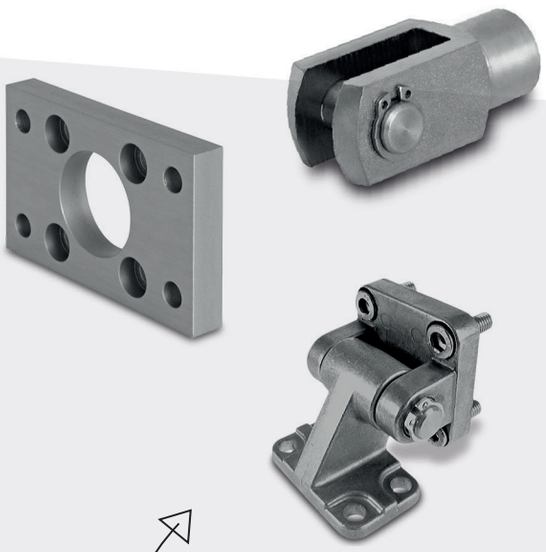
Mountings

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

Switches

Reed and solid state 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.



A mounting option for every application

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

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

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

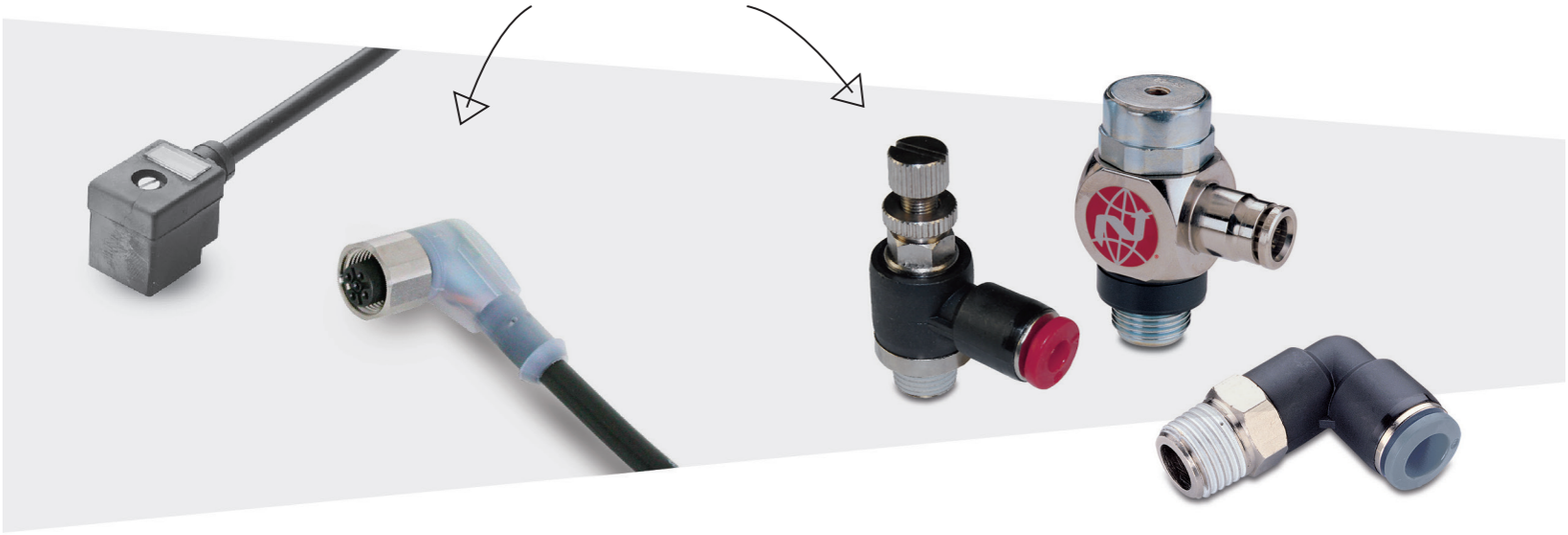
Suitable for use on all actuator ranges. Function fittings can be used to achieve optimum actuator control.

> 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.

All the accessories you need to complete your installation



Data Sheets

Range	Product	Data sheets
Industrial Cylinders	ISOLine™ P PRA/802000	N/en 1.5.220.01
	ISOLine™ R RA/802000	N/en 1.5.220.01
	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
	Stainless Steel KA/8000	N/en 1.5.127.01
Switches	M/50 reed switches	N/en 4.3.005.01
	M/50 solid state switches	N/en 4.3.007.01

IMI Precision Engineering operates four global centres of technical excellence and a sales and service network in 75 countries, as well as manufacturing capability in the USA, Germany, China, UK, Switzerland, Czech Republic, Mexico and Brazil.

For information on all IMI Precision Engineering companies visit **www.imi-precision.com**

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Due to our policy of continuous development, IMI Precision Engineering reserve the right to change specifications without prior notice.

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Engineering GREAT Solutions

IMI NORGREN

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IMI MAXSEAL

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