PHASE

MADE IN BRITAIN

DIAPHRAGM VALVES

VALVE BODIES	DIAPHRAGMS
MANUAL BONNETS	LCA ACTUATORS
LCSB SWITCH BOXES	RISING HANDWHEEL INDICATOR

WWW.PHASEVALVES.COM

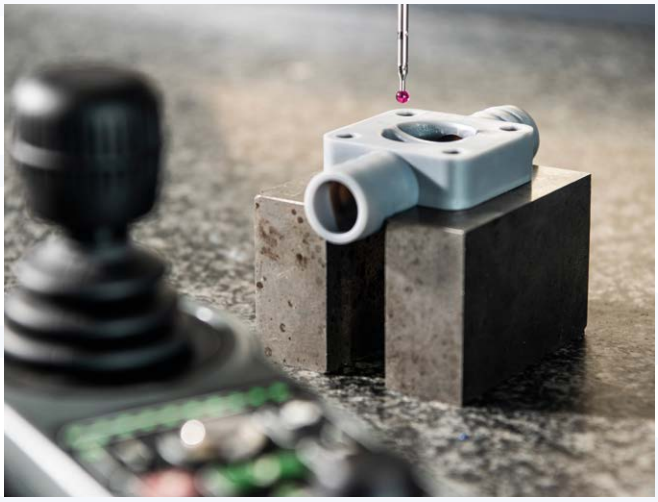
COMPANY OVERVIEW

MANUFACTURING

Phase manufacture our own range of products. Phase trunnion mounted ball valves and butterfly valves for the nuclear, oil & gas and subsea markets. Phase hygienic diaphragm valves for the aseptic markets, Phase sprung disc check valves, Phase control panels and Phase distribution manifolds. All these are in addition to mounting kits, switch boxes, actuators and spindle extension kits.

EXPORT

Our Export Department has been shipping goods all over the world for more than 150 years. In the last 5 years alone, we have supplied equipment to over 80 different countries.



QUALITY ASSURANCE

We hold the highest quality approval, ISO 9001:2015 audited and approved by LRQA. We also hold PED approval for the manufacture, modification and assembly of valves, and PMI capability.

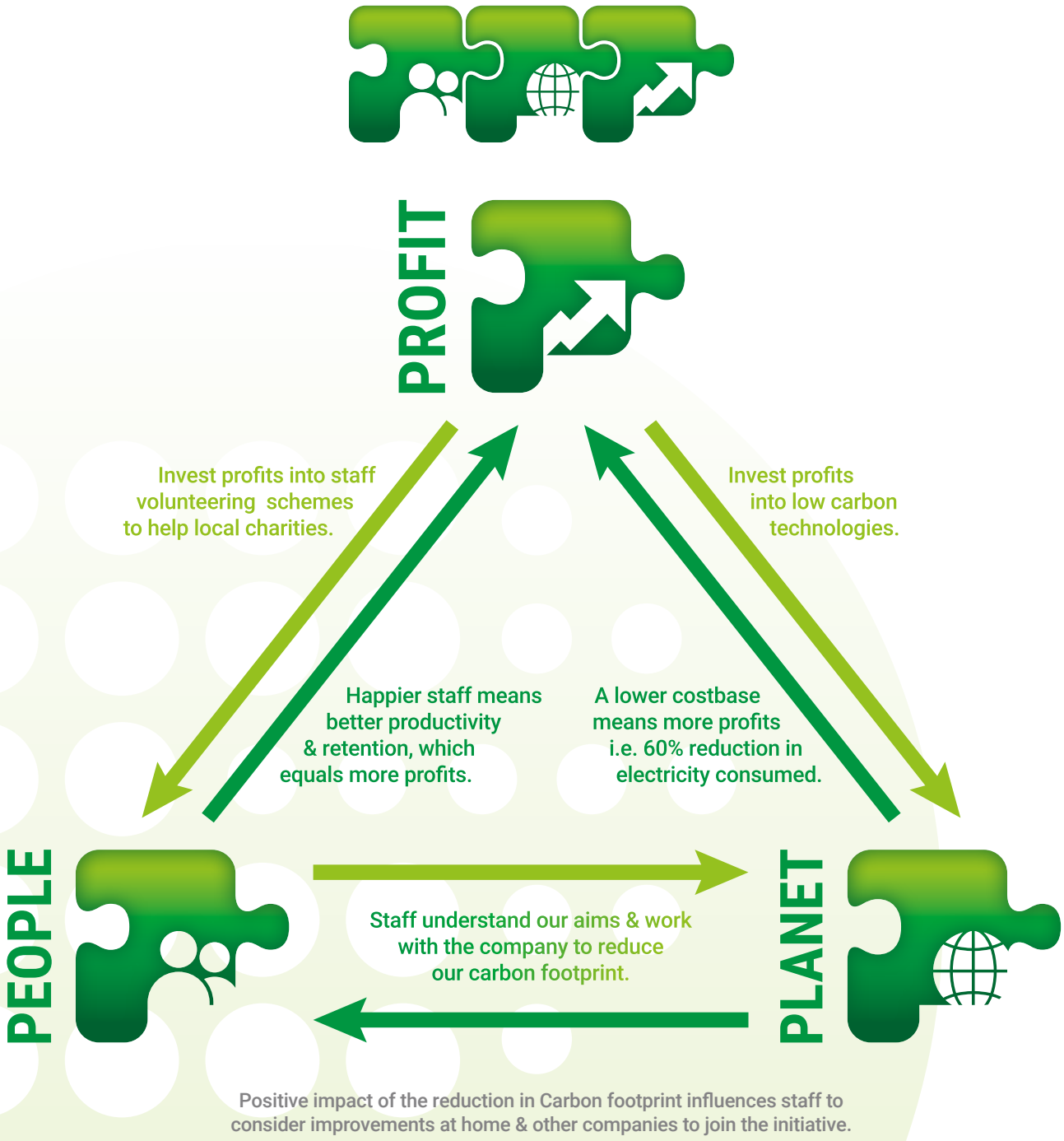
LRQA CERTIFIED ISO 9001

MEMBER OF BVAA

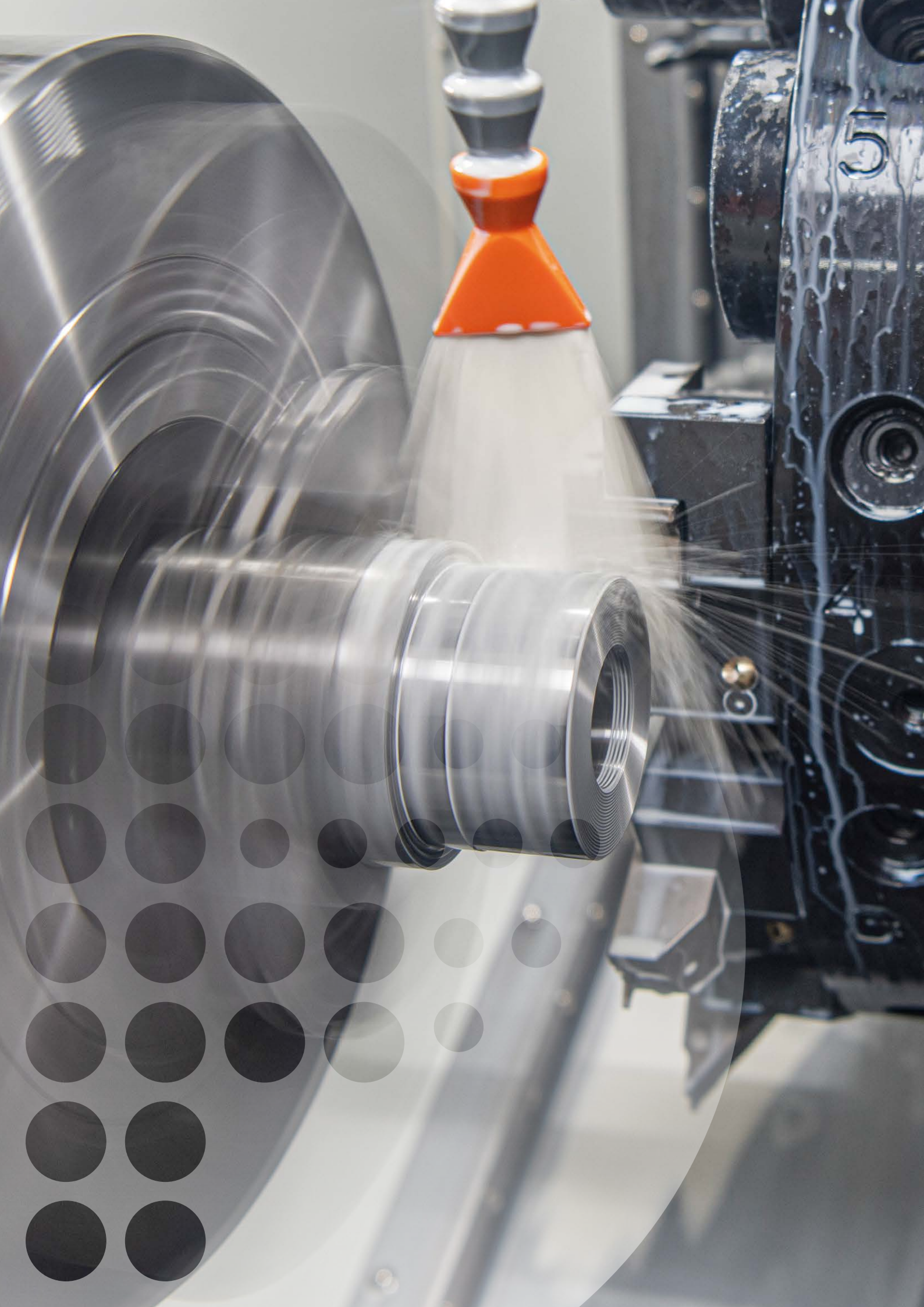
ASSOCIATIONS

In addition to our LRQA approval, we are also members of the British Valve & Actuator Association (BVAA) and are registered with FPAL and Achilles UVDB.

3P's PROGRAM

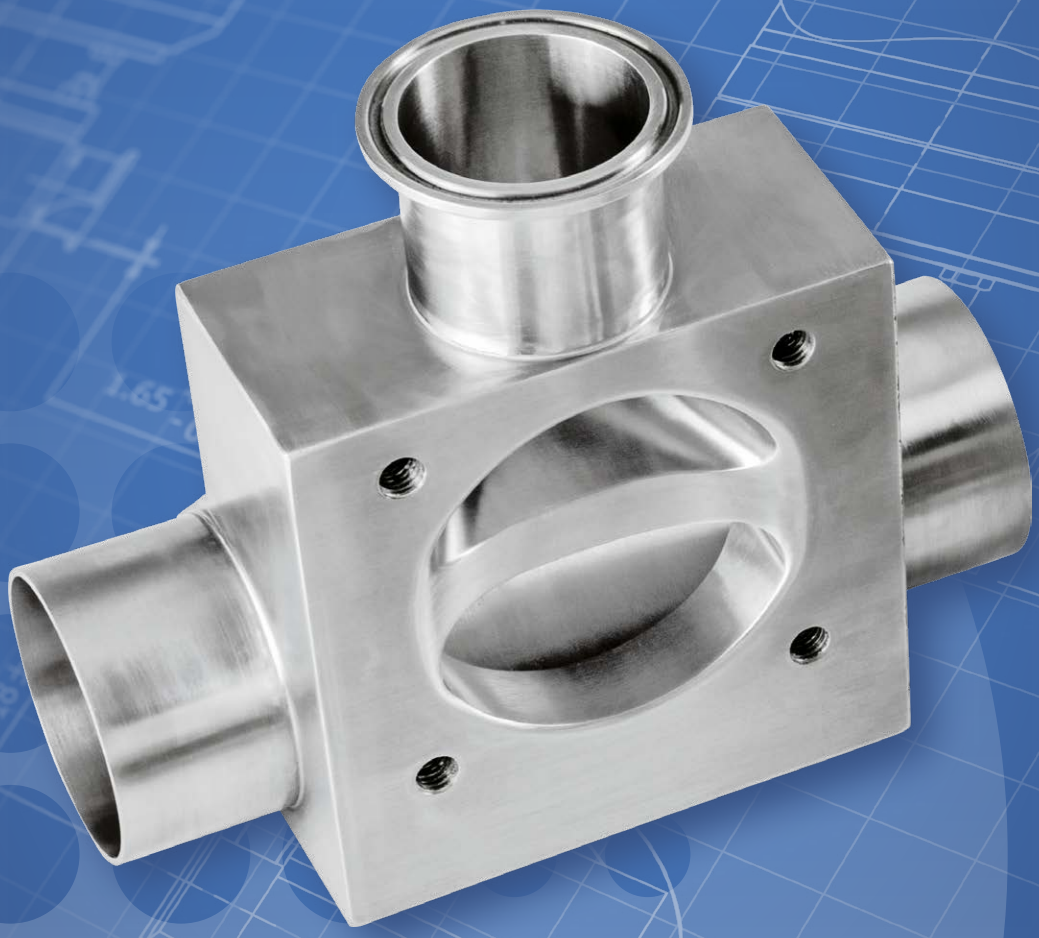


Our award winning 3P's program has seen the company halve its carbon footprint and double offset its remaining carbon output through planting over 18,000 trees, making Heap & Partners surpass carbon neutral and actually become Climate Positive. In addition every member of staff gets 6 days paid volunteering time to help local charities. If they use their time to fundraise, Heaps will match the amount raised.



PHASE DIAPHRAGM VALVES

VALVE BODIES



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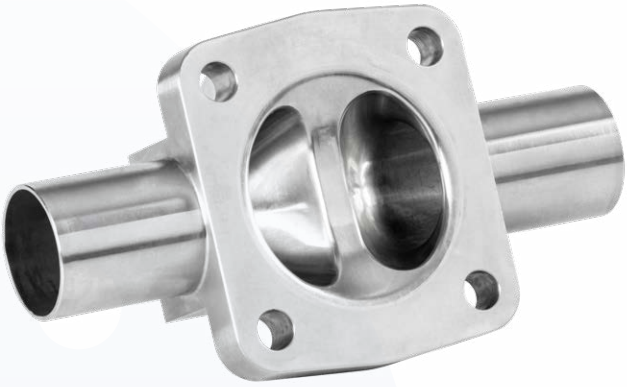
STANDARD 2-WAY BODIES
(DN8-DN50/¼"- 2")

The standard 2-way valve body is the basic building block of diaphragm valve technology. Phase 2-way forged bodies are manufactured from 316L/1.4435 stainless steel bar. Exotic/special alloys are also available on request.

The forging process results in a homogeneous surface that is free of defects such as porosity, inclusions, or shrinkage cavities. This defect-free surface is an ideal substrate for the high levels of mechanical and electropolished surfaces demanded by the clean processing industries to maintain sterility and optimise cleaning processes. Phase forged bodies are manufactured to achieve low ferrite levels of less than 0.5% maximum. This reduces the potential for migration of oxides through a high purity water system.



FEATURES:

- Cavity-free & self-draining
- Readily incorporated into valve cluster & access valve fabrications
- Materials of construction & surface finish compatible with industry standard system requirements
- Bi-directional flow path
- Full traceability to EN 10204 3.1 & ASME BPE
- Exotic/special alloys are also available on request

MACHINED FROM SOLID 2-WAY VALVE BODIES
(DN100-DN150/4.00”- 6.00”)

Larger size designations are machined from solid wrought stainless steel bar stock.

This construction brings the same high level of surface integrity and metallurgical security as the 2-Way forged bodies.

FEATURES:

- Unique body flats to indicate self drain angle
- Integral weld & hygienic clamp ends
- Controlled sulphur, 0.005%-0.017 per ASME BPE Standard
- Exotic/special alloys are also available on request

ZERO DEADLEG ‘TEE’ PATTERN RANGE

The Phase Tee valve combines a single weir with a tee pattern body. This design eliminates the deadleg present when a 2-way valve is welded or clamped to a tee fitting and has become a biopharm standard.

Essential for the elimination of deadlegs in recirculating loops and designed to ease installation and validation, Phase Tee Valve enhances the integrity of critical systems.

FEATURES:

- Compact design providing excellent drainage characteristics & absence of deadleg
- Machined block construction with no internal fabrication welds offer optimum security
- Sampling/injection points on high purity water systems

Product Contact (ID) Surface Finish Options			
Finish	Measurement		
	Ra (Micro Inch)	Ra (Micro Meter)	ASME BPE SF Code
Mechanical Only	30	0.8	SF3
Mechanical Only	25	0.6	SF2
Mechanical + EP	25	0.6	SF6
Mechanical Only	20	0.5	SF1
Mechanical + EP	20	0.5	SF5
Mechanical + EP	15	0.4	SF4

All finishes are average Ra. Acceptance criteria as per Tables SF-1/SF-2. Customer specific finishes also available including electropolishing where required.

TANK BOTTOM VALVES

The Phase tank bottom valve incorporates the performance and features of a diaphragm valve into a machined from solid tank outlet design. These valves are free from fabrication welds and deadlegs, enhancing structural integrity and reducing the potential for process contamination. The absence of deadlegs also improves drainability and facilitates effective mixing.

Sample valves, purge valves and ports are easily incorporated into the tank bottom design to achieve the desired performance. The resulting valve types are a hybrid or compound solution that entails the use of more than one valve concept; for example, combining a tank bottom valve with an access valve, a multi-port valve with access valves to perform as steam and condensate ports or a point-of-use valve together with a sample valve. This process, combined with our manufacturing expertise, results in custom valve configurations that combine utility and performance.

VALVE MANIFOLD / CLUSTERS

Configuration of optimum process fabrication presents system designers with an ongoing challenge. Minimum space envelope, reduced hold-up areas, reduced cost, and facilitating ease of installation are all key considerations.

Our expert customisation service is tailored to deliver the ideal valve configuration for each customer's specific process requirements. Using Piping and Instrumentation Diagrams (P&ID), our engineers develop a proposed solution, presented as a fully detailed 3D drawing for customer review and approval. All Phase process fabrications are built using either high-quality forgings or precision-machined bar stock components, ensuring maximum process integrity.

FEATURES:

- Manufactured under stringent ISO 9001:2015 quality control
- Tailor-made solutions to customer requirements
- Fully tested assembled units manufactured under controlled conditions
- Full traceability of all components
- Reduced on-site fabrication time and costs

PHASE DIAPHRAGM VALVES

DIAPHRAGMS

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GRADE E7 EPDM DIAPHRAGM

Phase Grade E7 EPDM diaphragm material was developed specifically for critical applications in the Biopharmaceutical Industry.

It has been developed and extensively tested in the manufacturing plant's development laboratory and third-party tested at the BioProcess Institute.

GRADE:

- E7

MATERIAL:

- Ethylene Propylene Diene Monomer *(peroxide cured)*

SIZE:

- DN8 - DN50
  (for sizes DN65 and upwards please consult factory for availability)

TEMPERATURE RATING:

- -40 °C to +110 °C (-40 °F to +230 °F) Liquid Media
- -30 °C to +150 °C (-22 °C to +302 °C) Max Steam Sterilization
  (max 180 minutes per cycle)

REGULATORY COMPLIANCE:

- FDA 21 CFR 177.2600
- USP Class VI, <87>, <88>
- ISO 10993-5, -6, -10, -11
- ASME BPE part SG
- Certified Animal Derived Ingredient Free
- EMEA /410/01 TFE/BSE
- Fully lot traceable to EN 10204 3.1

FEATURES:

- Improved resistance to steam, WFI and commonly used CIP chemicals, buffers, protein solutions and other products
- Fabric reinforced to provide full support for the elastomer face and to increase flex performance
- Peroxide cured for optimum cross-linking performance and to minimize extractables and leachables
- Reduces the need to re-torque and assures seal integrity
- Enhanced surface finish integrity to assist process purity *(ASME BPE compliant)*

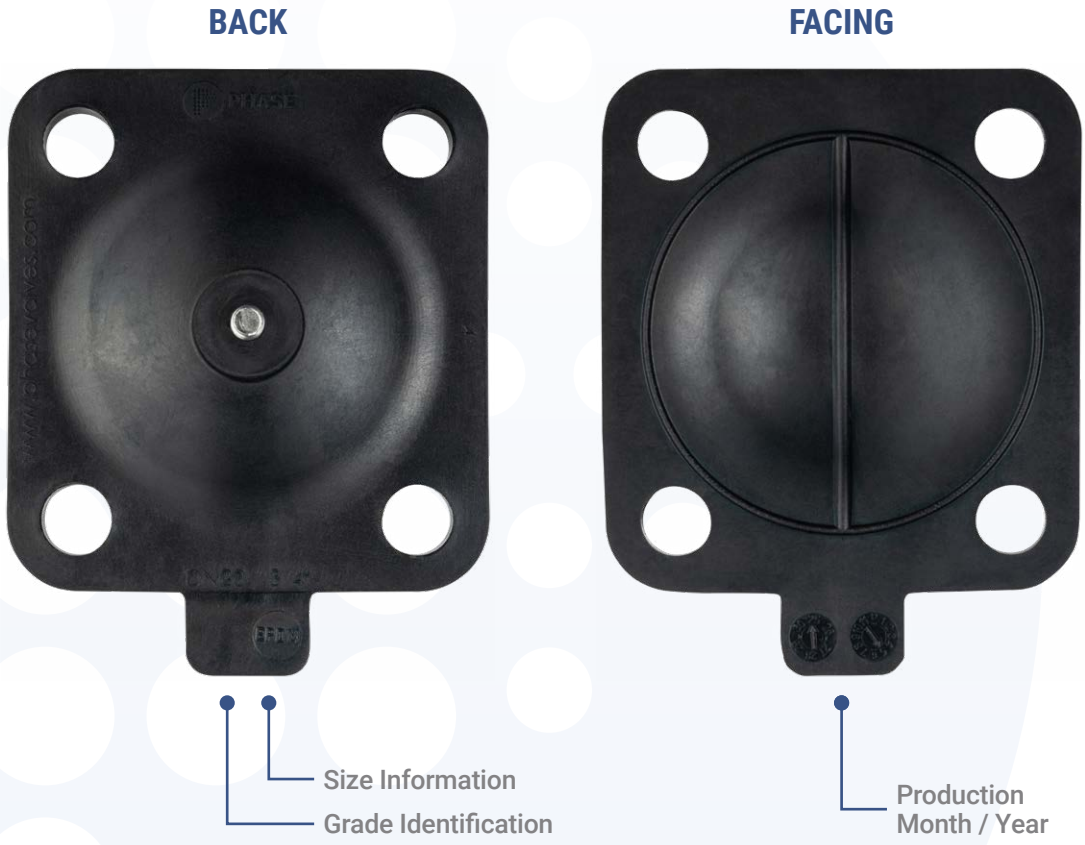
GRADE E7 EPDM DIAPHRAGM

CONSTRUCTION:

- Grade E7 EPDM
- Organic Peroxide cured
- Excellent resistance to compression set
- Excellent mechanical and thermal properties
- Fabric reinforced to optimise flex

DIAPHRAGM TRACEABILITY:

- All diaphragm materials and physical properties are batch traceable with permanent codes moulded onto the diaphragm. Moulded information includes manufacturing date/cure date, material grade, and diaphragm size.



TFM™ *(PTFE)* / EPDM DIAPHRAGM

Phase TFM™ (PTFE) backed EPDM (Grade E7) diaphragm material was developed specifically for the critical process protocols and applications in the Biopharmaceutical Industry.

It has been developed and extensively tested in the manufacturing plant's development laboratory and third-party tested at the BioProcess Institute.

GRADE:

- TFM™ *(PTFE)* backed EPDM

MATERIAL:

- Modified PTFE *(TFM™)* with Ethylene Propylene Diene Monomer - *(peroxide cured)* backing

SIZE:

- DN8 - DN50
  (for sizes DN65 and upwards please consult factory for availability)

TEMPERATURE RATING:

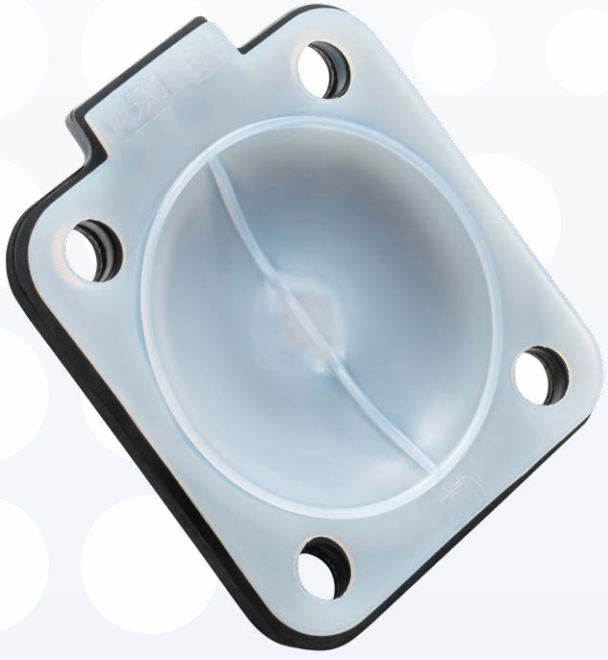
- -34° C to +176° C *(-30 to +350° F)*

REGULATORY COMPLIANCE:

- FDA 21 CFR 177.1550 *(a)*
- FDA 21 CFR 177.2600 *(backing cushion)*
- USP Class VI, <87>, <88>
- ISO 10993-5, -6, -10, -11
- ASME BPE part SG
- Certified Animal Derived Ingredient Free EMEA /410/01 TFE/BSE
- Fully lot traceable to EN 10204 3.1

FEATURES:

- Improved resistance to SIP and CIP processes, Compendium waters, buffers, protein solutions and other products. Ideal for applications subjected to intermittent steam service.
- The EPDM backing is fabric reinforced to provide full support for the elastomer and to increase flex performance.
- The EPDM backing is peroxide cured for optimum cross-linking performance and to minimize extractables and leachables. Enhanced surface finish integrity to assist process purity *(ASME BPE compliant)*.



TFM™ *(PTFE)* / EPDM DIAPHRAGM

ENHANCEMENTS OVER PTFE:

- Optimum ratio of crystalline and amorphous micro-structure
- Reduced creep and cold flow at elevated temperatures
- Greater dimensional stability
- Greater crack resistance
- Reduced permanent deformation under cyclic load
- Enhanced surface finish integrity to assist purity

MATERIAL *(2 PIECE CONSTRUCTION)*:

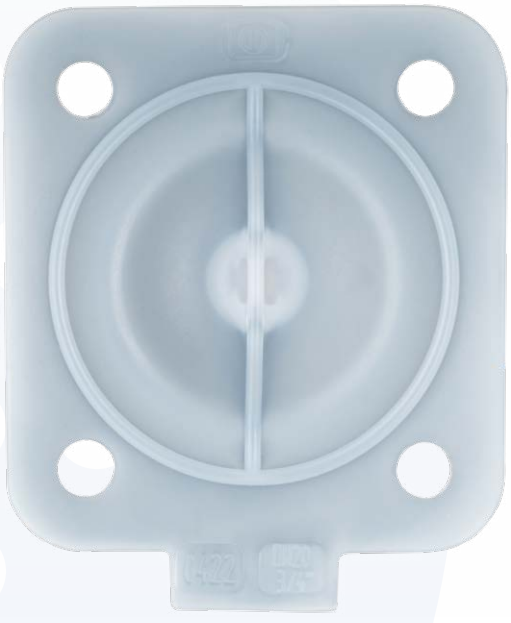
- TFM™ grade PTFE wetted face offers the widest temperature range of any polymer. TFM™ grade PTFE is inert to corrosive chemicals, has improved cleanability due to reduced permeation, reduced voids, pore free surface, and excellent anti-stick properties.
- E7 grade *(organic peroxide cured)* EPDM backing cushion offers excellent mechanical and thermal properties, excellent resistance to compression set, and is fabric reinforced to optimize flex.

DIAPHRAGM TRACEABILITY:

- All diaphragm materials and physical properties are batch traceable with permanent codes moulded onto the diaphragm. Moulded information includes manufacturing date/cure date, material grade, and diaphragm size.

BACK

FACING



TFM™ (PTFE) offers improved sealing and flex life.
All Grade E7 grade backing cushion have high performance woven fabric reinforcement.

VALIDATION & COMPLIANCE

The Pharmaceutical and Bioprocessing industries are governed by stringent process validation and maintenance protocols.

Phase recognises the importance of these stringent requirements and offers a complete selection of documentation to facilitate the validation process. Phase offers traceability and transparency in the entire manufacturing process of its diaphragms.

FEATURES:

- Physical properties, raw materials, compounding and moulding process are documented.
- Diaphragms are formulated in accordance to 21 CFR 177.2600 - Elastomers and 21 CFR 177.1550 Perfluorocarbons.
- Diaphragms are supplied with Certificate of Conformance per USP Class VI - Chapter 87 In-Vitro and Chapter 88 In-Vivo.
- Diaphragms are available with Certificate of Conformance per ISO 10993-5, -6, -10 and -11.
- Certificate of Compliance to EMEA/410/01 - BSE TSE Statement.
- Certificate of Traceability to EN 10204 3.1 B available upon request.
- Phase assures verified compliance with FDA, USP, ISO, and ASME BPE requirements through independent third-party testing.

Validation Package for

PHASE

Premium Replacement Diaphragms

GENERAL TEST AND ASSAYS OBTAINED FROM
North American Science Associates (NAMSA)

PHASE

Canada Works
399 Corporation Road
Birkenhead
Wirral
CH41 8FA
Tel: +44 151 488 7222
Email: info@heaps.co.uk

CERTIFICATE OF COMPLIANCE

Phase Material Grade: PTFE/E7
Polymer: PTFE Faced, Ethylene Propylene Diene Monomer (EPDM) Backed
Product Code: P/E

EU Conformity

We hereby declare that the above diaphragm is intended for contact with food products.
The diaphragm complies with the current version of the following regulations or regulatory codes:
- Regulation (EC) No. 1935/2004, incorporating EU 174/2015
- Regulation (EC) No. 2023/2006
- Regulation (EU) No. 10/2011

In accordance with the requirements of EC 1935/2004, this product has been manufactured using Good Manufacturing Practice (GMP) to EC 2023/2006.

Diaphragms manufactured from the above polymer comply fully with the requirements of EC 1907/2006 and do not contain any substances of very high concern as published in accordance with Article 59(10) of the REACH Regulation.

The diaphragm is free from the following materials:
- Asbestos
- Natural or Synthetic Latex
- PVC
- 2-mercaptobenzothiazole
- Bis(2-ethylhexyl) phthalate (DEHP)
- Bis(n-butyl) phthalate (DnBP DBP)
- Bisphenol A (SPA)
- Butyl benzyl phthalate (BBP)
- Diethyl phthalate (DEP)
- Diisodecyl phthalate (DIDP)
- Diisononyl phthalate (DINP)
- Dimethyl phthalate (DMP)
- Di-n-octyl phthalate (DNOP)
- N-nitrosamines

Materials of Fabrication

The materials used for the manufacture of the products comply with the current version of the positive list of Regulation (EU) No. 10/2011. No dual use substances are used in accordance with Regulation (EU) No. 10/2011.

The following material may come into contact with food products, if used in a correct application.
- PTFE

Issue:1 QA003-15-25 PTFE C...

PHASE

Canada Works
399 Corporation Road
Birkenhead
Wirral
CH41 8FA
Tel: +44 151 488 7222
Email: info@heaps.co.uk

CERTIFICATE OF COMPLIANCE

Phase Material Grade: E7
Polymer: Ethylene Propylene Diene Monomer (EPDM)
Product Code: E

EU Conformity

We hereby declare that the above diaphragm is intended for contact with food products.
The diaphragm complies with the current version of the following regulations or regulatory codes:
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- Regulation (EC) No. 2023/2006
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- Butyl benzyl phthalate (DEP)
- Diethyl phthalate (DEP)
- Diisodecyl phthalate (DIDP)
- Diisononyl phthalate (DINP)
- Dimethyl phthalate (DMP)
- Di-n-octyl phthalate (DNOP)
- N-nitrosamines

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The following material may come into contact with food products, if used in a correct application.
- EPDM

Issue:1 QA003-16-25 EPDM Diaphragm Certificate of Compliance-15-25 27/03/2025

DIAPHRAGM CONSTRUCTION

Replacement diaphragms for weir-style diaphragm valves are dynamic seals and must be constructed to withstand the critical applications in the Biopharmaceutical industry.

Every Phase brand diaphragm incorporates over 50 years of diaphragm manufacturing knowledge and experience.

DESIGN:

- The diaphragm design must mirror the weir contour and the diaphragm body flange. Elastomer diaphragms must not be stretched to reach the valve weir or allowed to fold, otherwise seal performance and service life will be impacted. The sealing bead across the centre of the weir, and the sealing bead around the circumference of the diaphragm face must also be mirrored. If the weir width of the diaphragm is too narrow, hot service can result in knife-like damage to the diaphragm, especially in PTFE faced diaphragms.
- Phase employs the latest 3D CT/Laser scanning for reverse engineering into CAD models. Colour error mapping software is used extensively during the diaphragm design process assuring that all Phase diaphragms adhere to the design of the respective OEM. Utilising 3D printing technology to generate diaphragm samples ensures that the diaphragm footprint, weir contour and sealing bead can be carefully reviewed and analysed prior to fabrication of the diaphragm mould.

FABRICATION:

- Phase elastomer diaphragms are produced by a compression moulding process. The diaphragm is constructed with layers of polymer material and high performance woven fabric reinforcement for maximum strength and durability. PTFE diaphragm shields are produced by a compression and sintering process under cleanroom conditions. The diaphragm manufacturing process, quality, performance and reliability of all Phase diaphragms is assured, third-party tested, and fully traceable.

OEM Diaphragm

Phase Diaphragms

Phase uses a reinforcement fabric that is carried from end-to-end in the diaphragm and encompasses the diaphragm bolt circles. Designs that omit this internal reinforcement fabric depend upon the elastomer to bare all physical stresses and mechanical loads. Flex life is greatly reduced and the risk of premature diaphragm failure is increased.

SEAL PERFORMANCE TESTING

Diaphragms are dynamic gaskets and must be designed and manufactured to withstand the critical applications of the Biopharmaceutical industry.

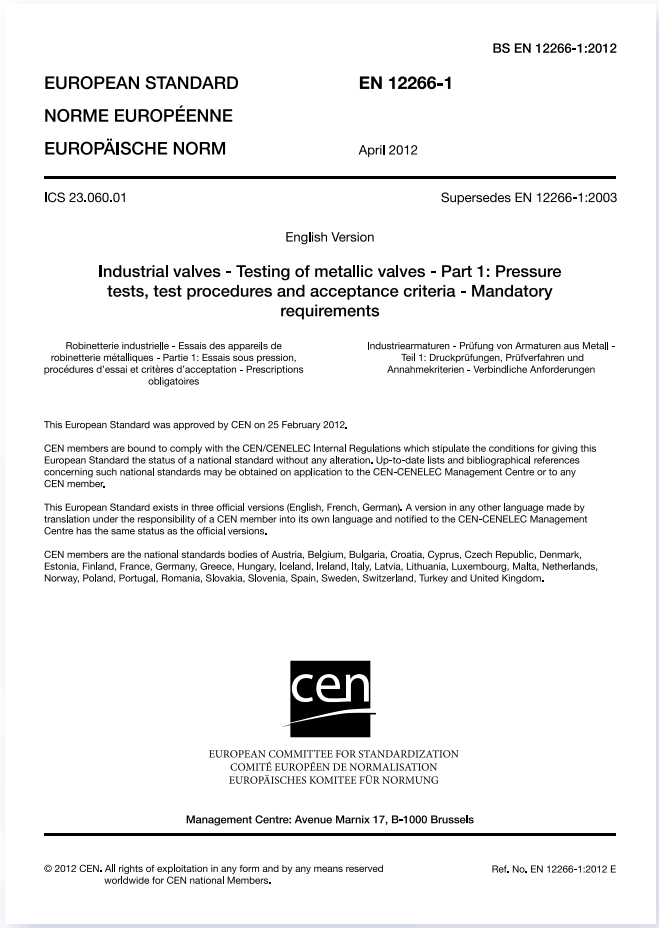
Phase diaphragms are backed by over 50 years of diaphragm manufacturing experience and knowledge. Phase diaphragms are designed, manufactured and tested to meet or exceed the pressure ratings and performance criteria of the OEM valve assembly.

EN 12266-1:

- Phase EPDM and TFM PTFE Backed EPDM Diaphragms undergo a Seat and Shell Bubble test (air and hydraulic) to EN 12266-1. *(Seal Test Certificates are available upon request)*

EUROPEAN PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU:

- Phase diaphragms conform to European Pressure Equipment Directive 2014/68/EU - Applied Harmonized Standard EN 12266-1.



BS EN 12266-1:2012

EUROPEAN STANDARD **EN 12266-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM April 2012

ICS 23.060.01 Supersedes EN 12266-1:2003

English Version

Industrial valves - Testing of metallic valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements

Robinetterie industrielle - Essais des appareils de robinetterie métalliques - Partie 1: Essais sous pression, procédures d'essai et critères d'acceptation - Prescriptions obligatoires

Industriearmaturen - Prüfung von Armaturen aus Metall - Teil 1: Druckprüfungen, Prüfverfahren und Annahmekriterien - Verbindliche Anforderungen

This European Standard was approved by CEN on 25 February 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 12266-1:2012 E

PACKAGING, STORAGE & SHELF LIFE

Phase diaphragms are individually shrink-wrapped on to cardboard to prevent contamination and damage during transit, storage, and handling.

The packaging has a clear side for viewing the diaphragm and a white backing which is marked with detailed diaphragm information.

TEMPERATURE & HUMIDITY:

- Diaphragms should be stored in a cool, dry location. Storage temperature should be below 25 °C (77 °F). Higher temperatures and condensation caused by humidity may cause certain forms of deterioration and shorten the service life of the diaphragms. Likewise, colder temperatures may cause the diaphragms to stiffen and distortion may occur.

OXYGEN & OZONE:

- Diaphragms should be stored in air-tight containers and protected from circulating air. Equipment capable of generating ozone such as mercury lamps, electric motors (AC or DC), and other equipment that produce electrical sparks or discharge can be aggressive to elastomer products.

LIGHT:

- Diaphragms should be protected from direct sunlight and strong artificial light with ultra-violet content. Diaphragms should be kept in their original packaging and stored in dark or opaque containers until used.

DEFORMATION:

- Diaphragms should be stored in a relaxed condition, free from compression, tension or other forms of deformation. Warping and distortion may occur if heavy objects are stored on top of the diaphragms.

CONTACT WITH METALS, LIQUID OR SEMI-SOLID MATERIALS

- Copper, Iron, and Manganese can have a damaging effect on elastomer products. Care should be taken to protect the diaphragms and it is recommended that the diaphragms should be wrapped or separated with paper or polythene, otherwise, diaphragms should be kept in their original packaging until ready for use. Diaphragms should not come into contact with solvent oils, and greases while in storage as this will cause deterioration and shorten the service life.

CLEANING:

- Do not use organic solvents such as carbon tetrachloride, trichloroethylene or petroleum spirit to clean the diaphragms. If required, it is recommended that diaphragms are cleaned with mild soap and water only.

ROTATION OF STOCK:

- The shelf life of diaphragms is dependent on many factors. Vulcanised rubber articles like diaphragms should remain in storage for the least amount of time possible, and diaphragm stock should be rotated periodically.

As a guide, the expected minimum storage life, if storage conditions are followed is as follows:

MINIMUM EXPECTED LIFE 10 YEARS

- **ELASTOMER DIAPHRAGMS**
  EPDM *(Peroxide Cured, Post Cured)*, FPM, Buna, Dicumyl Cured Silicone.
- **PTFE DIAPHRAGMS**
  PTFE *(TFM™)* backed EPDM, (Peroxide Cured, Post Cured), PTFE *(TFM™)* backed FPM, PTFE *(TFM™)*.

PHASE DIAPHRAGM VALVES

MANUAL BONNET

WWW.PHASEVALVES.COM

MANUAL BONNET

The Phase manual bonnet is designed for use with the Phase range of diaphragm valves, and is also directly compatible with the Saunders range of diaphragm valves. This innovative product is available in size range 8mm to 50mm.

Made from high quality Grade 316 Stainless Steel, options include a sealed electro polished version for enhanced aesthetics and performance. The standard version comes with a stainless steel handwheel, but a plastic handwheel option is also available to suit your specific needs. Manufactured in the UK, our manual bonnet is available from stock, ensuring quick and efficient delivery.

KEY FEATURES:

- Compatible with Phase & Saunders diaphragm valves
- Size range: 8mm, 10mm, 15mm, 20mm, 25mm, 40mm, 50mm
- Material: stainless steel
- Options: sealed version (electro polished)
- Stainless steel handwheel or optional plastic handwheel
- Manufactured in the UK
- Available from stock
- Rising hand wheel with visual indicator

For more information or to place an order, please contact our sales team.

Sealed & Electro Polish Finish

Non Sealed Standard Finish

PHASE DIAPHRAGM VALVES

LCA ACTUATOR

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LCA ACTUATOR

Phase Linear Compact Actuator (LCA) is designed to meet industrial demands for efficient, high integrity, diaphragm valve actuation with the benefits of a lightweight, compact, and cost-effective construction.

The Phase LCA actuator range is designed for use with Weir type diaphragm valves in sizes 8mm to 50mm, being suitable for use on all rubber and PTFE grades of diaphragm and providing reliable 100% leak tight shutoff.

The LCA Linear Compact Actuator can be ordered as part of a whole new actuated valve assembly, or separately as a stand-alone item to enable conversion of existing manual valves to pneumatic operation. Installation can be carried out in-line or within a workshop facility.

FEATURES & BENEFITS:

- Compatible with both Saunders & Phase Diaphragm valves
- Three operation modes - Double Acting, Spring Open, Spring Closed
- Various spring pack options to suit individual line pressure requirements
- Operating air supply rated to maximum 8 BarG 116psi *(normal operating pressure 6BarG 87psi)*
- Available in sizes DN8 to DN50
- Temperature range of -10° C to +80° C
- Tight shutoff to 10BarG line pressure *(100% Δp rubber diaphragm)*
- Durable materials of construction - acetal enclosure with Stainless steel 316 componentry *(316 enclosure option available)*
- Compact design to minimise air consumption
- Piston type pneumatic actuator for reliable 100% shutoff
- Namur mount for direct solenoid connection to minimise assembly envelope
- 1/8" BSPP ports for direct piping as standard *(NPT option available on request)*
- Interchangeable compressors to swap between button, screw or bayonet diaphragms without actuator strip down
- Top mounting pad to secure ancillary attachments such as Phase LCSB Switchbox
- 8mm with 2 or 4 bolt attachment, 10mm with 2 bolt attachment only

MODES OF OPERATION

SPRING CLOSE:

- This type of actuator requires a constant supply pressure to keep the valve in the open position. Loss of air supply, or designed withdrawal will cause the valve to shut off and remain so against maximum permissible line pressure.

SPRING OPEN:

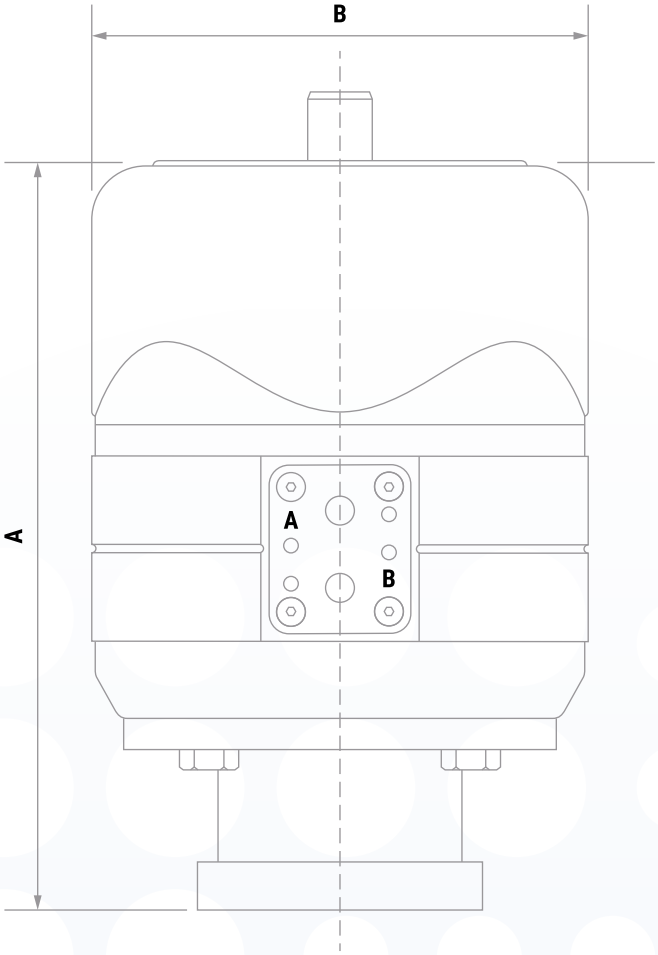
- This type of actuator requires a constant supply pressure to keep the valve in the closed position. Loss of air supply, or designed withdrawal will cause the valve to open and remain so.

DOUBLE ACTING:

- This type of actuator requires two air supply lines, one to open the valve, the other to close it. Loss of air supply, or designed withdrawal will cause the valve to drift open against line pressure.

LCA ACTUATOR

SPECIFICATION:

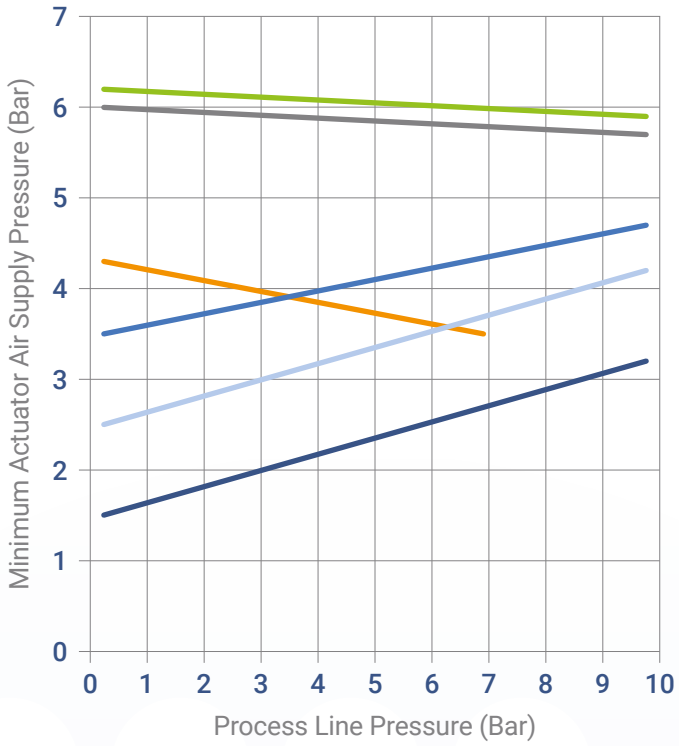


Materials of Construction	
Component	**Material**
Actuator Body & Cover	Acetal Resin, Black
Spindle	316 Stainless Steel
Seals	Nitrile
Spring	Chrome Alloy
Namur Mount	316 Stainless Steel with Nitrile Gasket
Spool	316 Stainless Steel

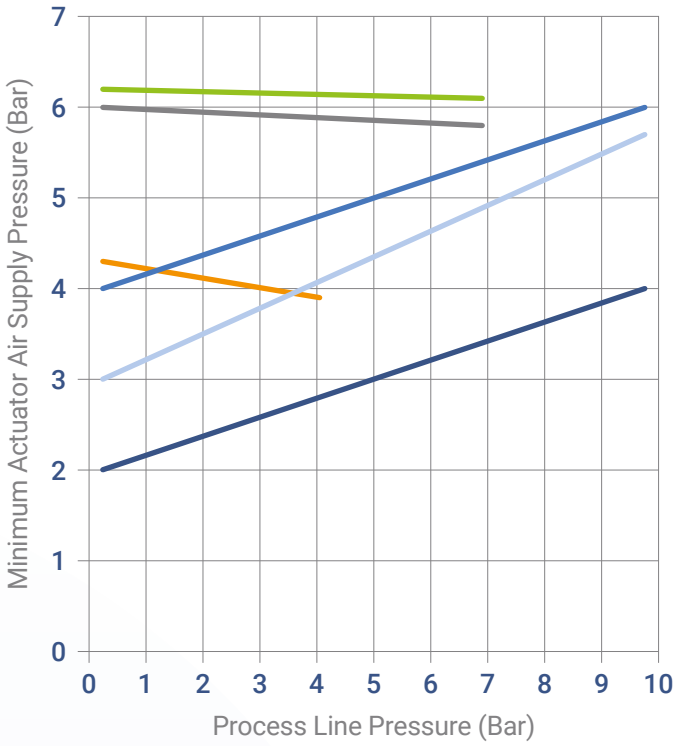
Envelope Dimensions (mm) & Weights			
DN Valve Size	**A**	**B**	**KG**
8	120	60	0.64
10	135	74	1.05
15	135	74	1.06
20	152	107	2.4
25	152	107	2.4
40	232	156	9.0
50	232	156	9.5

Z	A	25	BN	LCA	SC	6	S	C	A	N	B	T
Phase Product	**Type**	**Size**	**Bonnet**	**Bonnet Type**	**Fail Action**	**Spring**	**Spool Material**	**Spool to Body Fixing**	**Head Material**	**Seal Material**	**Air Port**	**Diaphragm Fixing**
		8mm 10mm 15mm 20mm 25mm 40mm 50mm		LCA Actuator	SC = Spring Close SO = Spring Open DA = Double Acting	2 Bar Spring *(Only on 20mm & 25mm)* 4 Bar Spring 6 Bar Spring *(std)*	S = 316 St/St *(std)* A = Acetal	C2 = 2 Clear Holes *(8mm & 10mm only)* C = 4 Clear Holes *(Std)* M = 4 Metric Thread Holes I = 4 Imperial Thread Holes	A = Acetal *(Std)* S = St/St	N = Nitrile *(Std)* -10°C to +80°C V = Viton -5°C to +80°C	B = BSP *(Std)* N = NPT	T = Threaded *(Std)* B = Bayonet P = Push Fit Button *(up to 20mm)*

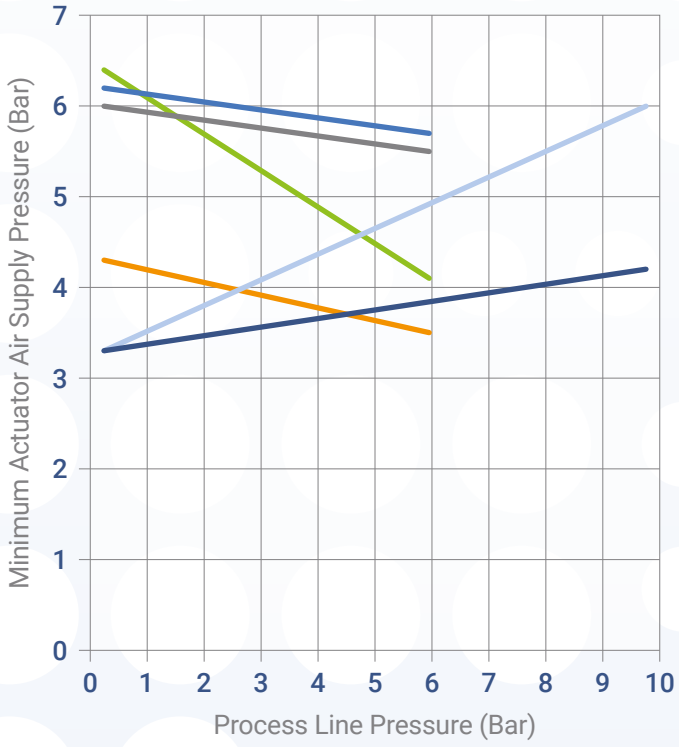
100% DP - RUBBER DIAPHRAGMS



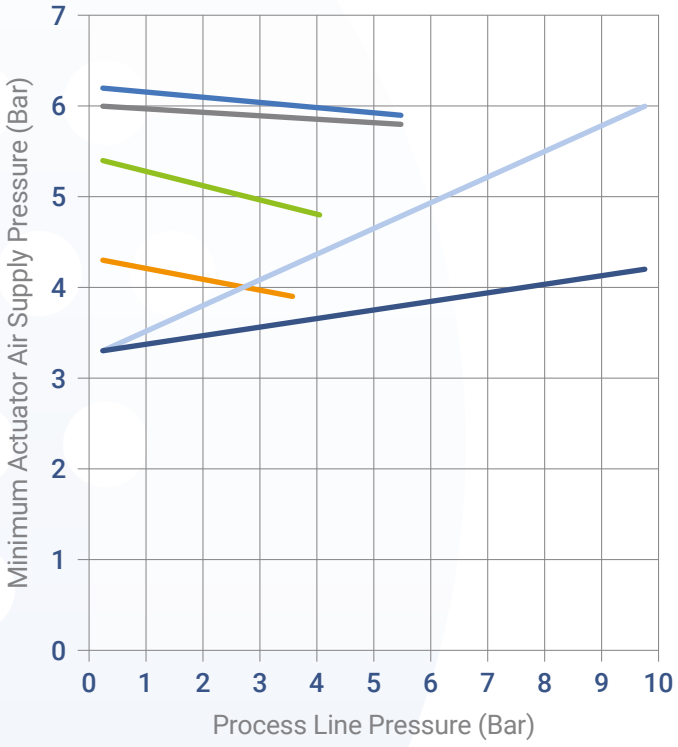
0% DP - RUBBER DIAPHRAGMS



100% DP - PTFE DIAPHRAGMS



0% DP - PTFE DIAPHRAGMS



KEY:

4B SC - 4 Bar Actuator Spring Closed
6B SC - 6 Bar Actuator Spring Closed
SO/DA - Spring Open or Direct Acting

RUBBER

- 8, 10, 15, 20, 25, 40, 50 *(4B SC)*
- 8, 10, 15, 20, 25, 40 *(6B SC)*
- 50 *(6B SC)*
- 8 SO/DA
- 20, 40 SO/DA
- 15, 25, 50 SO/DA

PTFE

- 8, 10, 15, 20, 25, 40, 50 *(4B SC)*
- 50 *(4B SC)*
- 8, 10, 15, 20, 25, 40 *(6B SC)*
- 50 *(6B SC)*
- 8, 20, 40 SO/DA
- 15, 25, 50 SO/DA

PHASE DIAPHRAGM VALVES

LCSB SWITCHBOX

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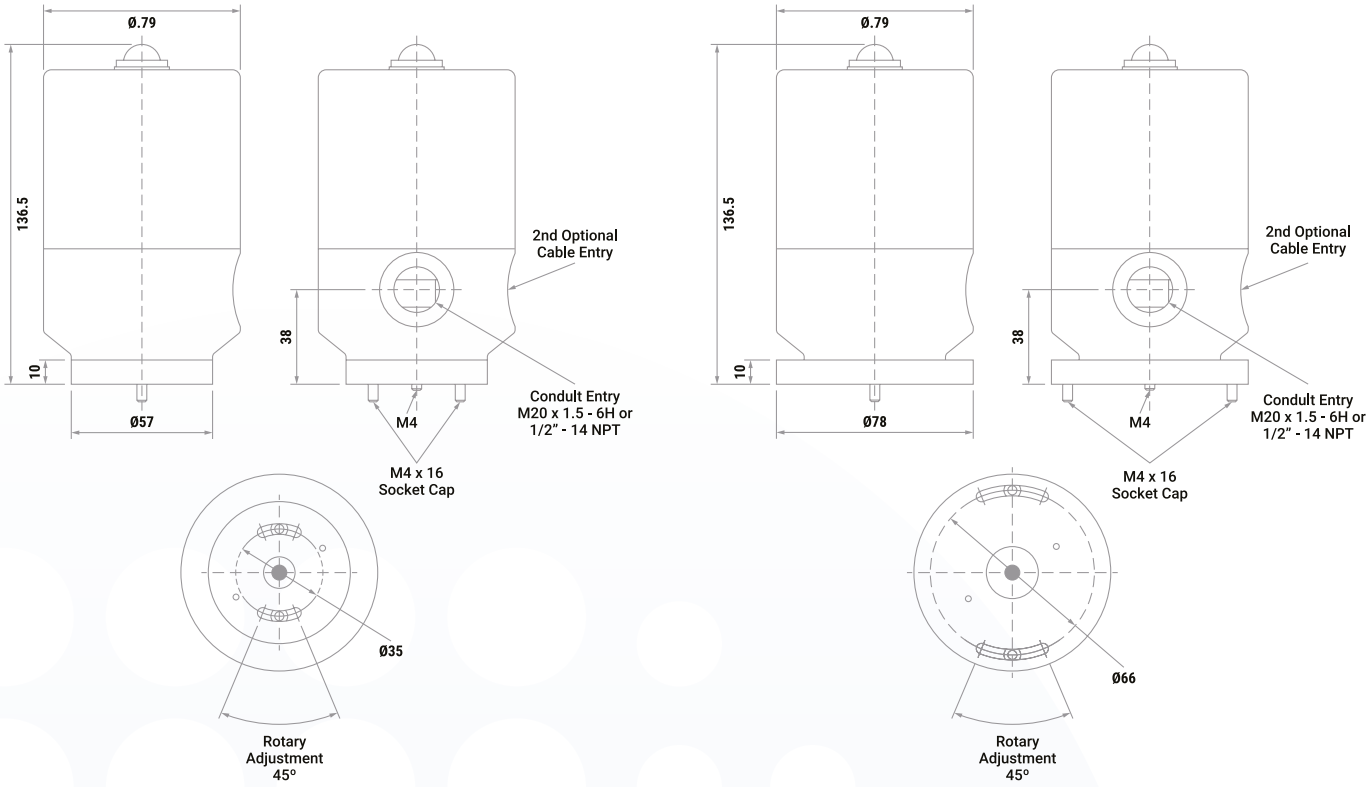
LCSB SWITCHBOX

CAPABILITIES:



DN8-25 LCSB Dimensions

DN40-50 LCSB Dimensions

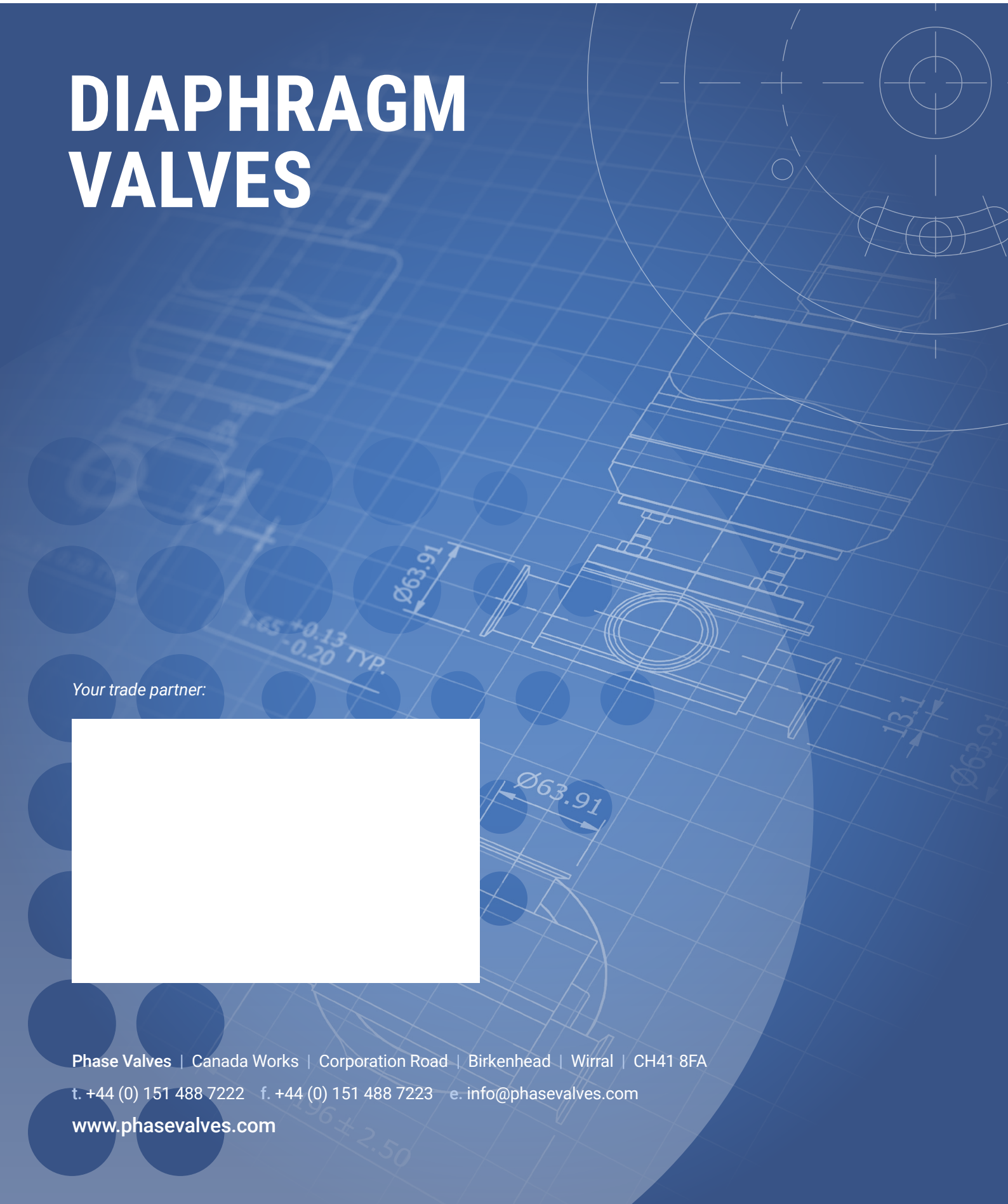
Overall height required for cover removal is 225mm

Specification Range	
Suitable	Phase LCA actuators, Saunders EC, SSC & S360 actuators for A & HC4 type valves *(spring close, spring open & double acting models)*
Size Range	DN8-50 inclusive
Enclosure Connection	1 x M20 x 1.5 *(standard)*, 1/2" NPTF *(optional)*, Optional 2 x entries for solenoid back wiring
Enclosure Rating	IP66 for Ex. Area, IP67 for Safe Area
Terminals	5 Way 2.5mm² conductor plus 2 terminals for back wiring where specified
Switch Options	No. of switches - 1 or 2. / S.P.D.T. / Silver *(standard)* / Gold *(optional)*. No. of sensors 1 or 2 , 2 wire NAMUR , 2 wire PNP/NPN, 3 wire PNP, 3 wire NPN. NAMUR , 2 wire PNP/NPN, 3 wire PNP, 3 wire NPN.
Solenoid Mounting	Option available on request
Method of Calibration	Self Calibrating
Material of Construction	Acetal, Black
Seals	Viton Rubber
Temperature Range	-10 ºC to +80 ºC (non IS) EExiaIIC, T5: -10 ºC to +80 ºC, T6: -10 ºC to +65 ºC
Standards	EU directive compliance | CE marked | Machinery directive (EU) 2023/1230 | LV directive *(micro switch variants)* 2014/35/EU EMC directive *(sensor variants)* 2014/30/EU | ATEX directive 2014/34/EU
Weight	0.7Kg

PHASE

MADE IN BRITAIN

DIAPHRAGM VALVES



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