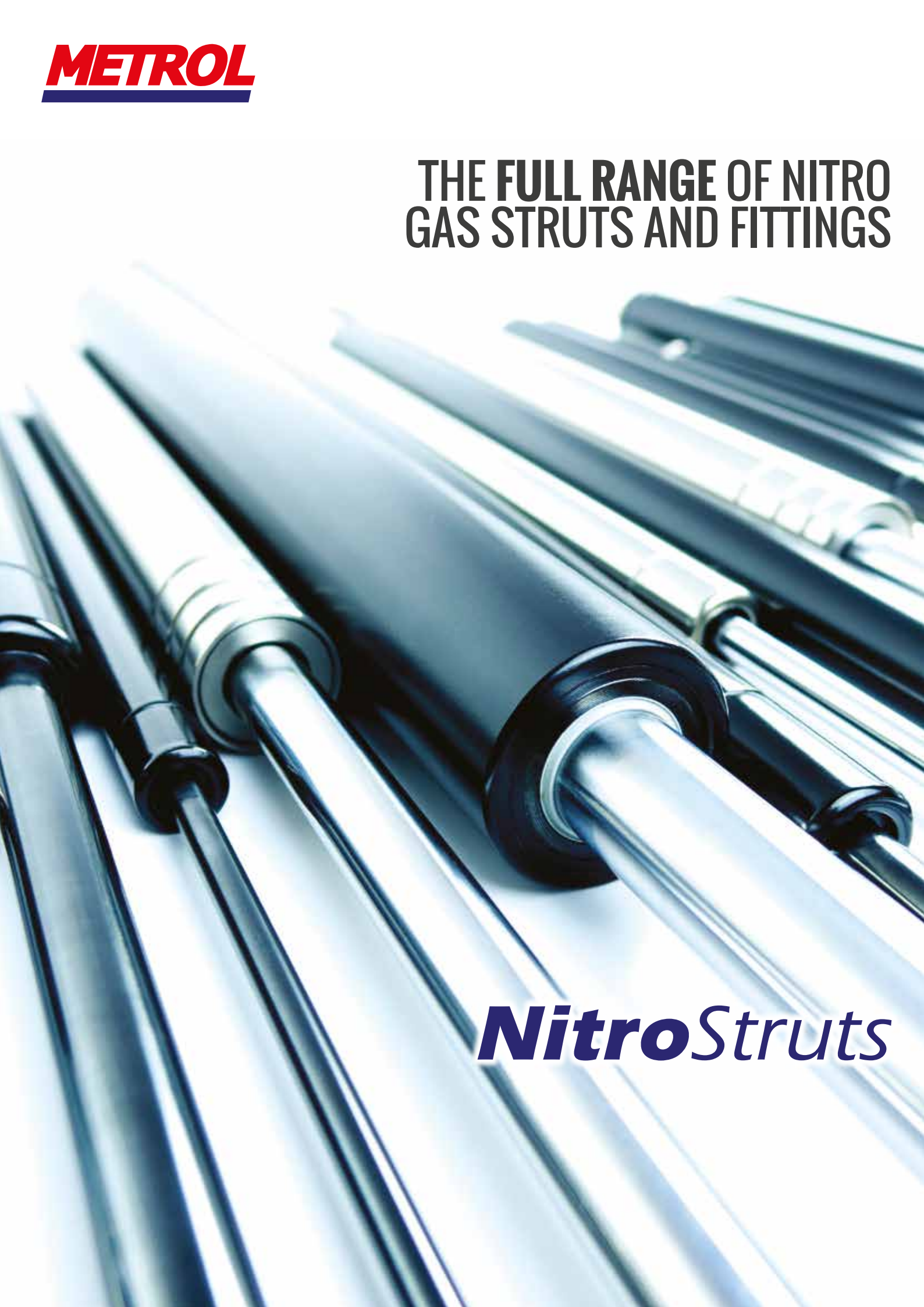
METROL

THE **FULL RANGE** OF NITRO GAS STRUTS AND FITTINGS



Nitro*Struts*

INTRODUCTION

Metrol Springs Ltd are specialists in the design, manufacture, and supply, of gas spring products. We offer the largest range of gas springs and struts available in the UK, ranging from micro 12mm diameter, up to heavy duty industrial gas springs producing over 20 tonnes of force with a diameter of 200mm.

Metrol Springs are certified manufacturers of CE marked pressure equipment conforming to (PED) 2014/68/EU. This gives us the scope to manufacture a wide range of gas springs including products that require CE marking and documentation.

Our Nitro-Strut, and Nitro-Spring ranges of gas springs are used in a wide variety of industries and applications. Our expertise and experience in gas spring design, manufacture, supply and service has gained Metrol an excellent global reputation. A key factor in our success is directly attributable to our well trained, experienced, enthusiastic staff combined with our extensive range of products.

Metrol Springs can help you with your application and special project requirements, from design and modelling, through to supply of prototypes and production volumes.

Our gas strut design service for simple projects can turn a difficult job into a simple task where drawings are supplied with both a parts list, and fixing instructions.

We offer our customers:

- On site engineering back up
- Project design with CAD drawings
- Custom designs to suit your application
- Sales team support with real product knowledge and technical back up
- Stock, Kanban and JIT supply systems to suit customer requirements

- Extensive range of gas springs and struts including:
  - Variable
  - Stainless
  - Locking
  - Traction
  - Dampers

- Comprehensive range and stock of accessories including:
  - End fittings
  - Brackets
  - Locking tubes
  - Protection tubes
  - Dust covers

Metrol has the capability to supply quantities ranging from 1 to 100,000s. Working alongside our customers, we are able to offer stock call-off orders so that parts are always available for immediate dispatch.

This offers major advantages including:

- Reduced capital tied up in stock.
- Next day delivery times when stock is called off.
- Inventory management to avoid running out of parts.

As well as supplying OEMs we specialise in aftermarket replacement struts for existing equipment. Nitro-struts variable and fixed force struts give us the flexibility to provide a suitable replacement from stock.

The replacement strut forms are available on **page 81** or you can fill in the form on the website at **www.metrol.com/replacement_gas_struts**.

METROL

CONTENTS

FEATURES

What is a gas strut?

Gas struts are hydro pneumatic rams, the gas / oil filled units will give smooth controlled movement to lids, hatches and doors. Gas struts are self-contained, maintenance free units. When used in accordance with manufacturers' guidelines, they will give years of trouble-free service.

How a gas strut works

A gas strut consists of a rod that slides in and out of a pressurised sealed tube. The rod has a piston riveted to one end which prevents it from being forced out of the tube when pressurised.

The force of the gas strut is provided by the gas pressure acting on the cross sectional area of the rod. The higher the gas pressure, the higher the force of the strut. The piston has a metering orifice which allows the gas / oil to pass from one side of the piston to the other. By altering the size of this orifice the rate of extension can be varied.

The oil within the gas strut produces the damping characteristics throughout the stroke, subject to correct orientation. As the rod extends from a compressed position the oil zone will dampen the movement as it reaches its full extension, giving a smooth controlled stop. The damping characteristics can be changed by using different viscosity and volume of oil in the tube.

CHARACTERISTICS OF A GAS STRUT

As a gas strut is compressed, the force increases from an initial value to a final force. This increase can be expressed as force progression values which are shown on the product specification pages.

Values are given for standard gas strut sizes. By modifying the design of the strut, the force progression can be altered to suit the application.

APPLICATIONS

Where are gas struts used?

Gas struts are used in a wide variety of industries.

- Marine
- Lorries and Trailers
- Industrial Machinery
- Furniture
- Bus and Coach
- Machine Guards
- Caravans and Motorhomes
- Roof lights and Access Hatches
- And many more

For professional advice on your application, please **call us now on 01604 499 332**.

How can a gas strut be used?

NitroStruts are used to:

- Aid and assist in lifting
- Aid controlled movement
- Counterbalance when raising and lowering
- Damp movement
- Support an object in position
- Adjust position of an object

Which gas strut should be used?

There are a variety of Nitro-Struts available to suit different applications.

- Fixed Force
- Variable Force
- Traction
- Pin Locking / Mechanical Locking / Auto Locking
- Dampers / Dampened
- Stainless Steel

FREQUENTLY ASKED QUESTIONS

WHAT IS THE DIFFERENCE BETWEEN A VARIABLE AND FIXED FORCE STRUT?

A fixed force strut is charged to a specific pressure, prior to dispatch, this would be at the request of the customer. A variable gas strut is supplied at full charge pressure which allows the customer to release the pressure a little at a time until they are happy with the force once the strut is installed in their application.

HOW DO I KNOW WHICH STRUT TO ORDER AND HOW DO I INSTALL IT?

If installing a strut on a new application or replacing a strut with different dimensions or force we always recommend using our free gas strut design service. We are unable to accurately suggest a specific gas strut unless we have full details of the application on which it is going to be installed. You can find an example replacement strut order form on **page 81**, you can supply the details of your enquiry to **sales@metrol.com** or visit our design service found here: **www.metrol.com/metrol-gas-struts-design-service**

WHICH END FITTINGS AND BRACKETS SHOULD I USE?

If you are unsure which end fittings or brackets to use, please refer to our free gas strut design service (link above). We advise the use of ball joints where possible. Utilising ball joints enables you to prolong the life of the gas strut and reduces strain on the end fittings, by removing the risk of side loading.

I'VE PURCHASED A VARIABLE GAS STRUT, HOW DO I DEGAS IT?

To degas your variable force gas strut, insert the allen key in the valve at the base of the strut (the brass coloured collar) and turn anti-clockwise a quarter turn, venting the gas for 1 second at a time. This will release a small amount of gas to allow fine adjustments. For more information **see page 19**.

ARE YOU ABLE TO MANUFACTURE CUSTOM GAS STRUTS?

If you cannot find the specific size you are looking for amongst our standard range of gas struts, please get in touch and we can discuss your requirements for a custom made gas strut. Please see the example replacement form on **page 81** for information on what details will be required.

INSTALLATION INSTRUCTIONS

For standard compression gas struts we advise the use of ball joints to alleviate possible side loading, and uneven wearing of the piston rod/seals.

Install the strut, piston rod down, for optimum lubrication of the guide and sealing system at all times (**see figure 1**). Always install the strut in its relaxed state.

It is advisable to keep the strut in a single plane of movement. Failure to adhere to this advice may result in a reduced lifespan of the strut.

Ensure that the end fittings are tightly fastened onto the thread of the gas struts prior to fitting. If the end fittings require aligning, the piston rod of the gas strut can rotate inside the body (cylinder). Place and hold the piston end fixing on a flat surface, grip the cylinder and firmly twist it until the end fitting is aligned correctly (**see figure 2**).

fig .1

fig .2

Fitting brackets

When utilising a bracket with a ball stud/end, the procedure to fit it to the relevant ball joint fitting is as follows:

1. Remove the retaining clip from the ball socket by rotating it from around the collar of the socket, and then pull it out from the two locating holes.

2. Ensure the ball socket is fully tightened onto the thread of the strut. Then, using a vice or pair of pliers, grip the ball stud and with a rotating motion, remove the ball stud from the socket.

3. Once removed, place the ball socket over the corresponding bracket and press firmly downwards until a positive 'click' is heard.

4. Once the ball of the bracket is firmly located inside the socket, reinsert the retaining clip into the two locating holes, and clip it back over the collar of the socket.

If in any doubt as to the installation procedure please **contact Metrol on 01604 499 332**.

CATALOGUE
SYMBOLS EXPLAINED

STANDARD DAMPING

ADDITIONAL DAMPING
AVAILABLE

STAINLESS STEEL
RATING 304

STAINLESS STEEL
RATING 316

STAINLESS STEEL
UNAVAILABLE

PIN LOCKING
ELASTIC IN BOTH DIRECTIONS

PIN LOCKING
RIGID IN BOTH DIRECTIONS

PIN LOCKING
RIGID IN EXTENSION

PIN LOCKING
RIGID IN COMPRESSION

MECHANICAL LOCKING
LOCKED IN EXTENSION

MECHANICAL LOCKING
LOCKED IN COMPRESSION

VALVE IN SIDE
AVAILABLE

VALVE IN THREAD
AVAILABLE

PRO LINE PROTECTION
STRUT PROTECTION AVAILABLE

HOW TO ORDER

Use SS for stainless steel variant

STANDARD: NS-FF

STAINLESS STEEL: NS-SS-FF

6	40	B1	E1	350N
ROD Ø	STROKE	ROD END FITTING	TUBE END FITTING	FORCE

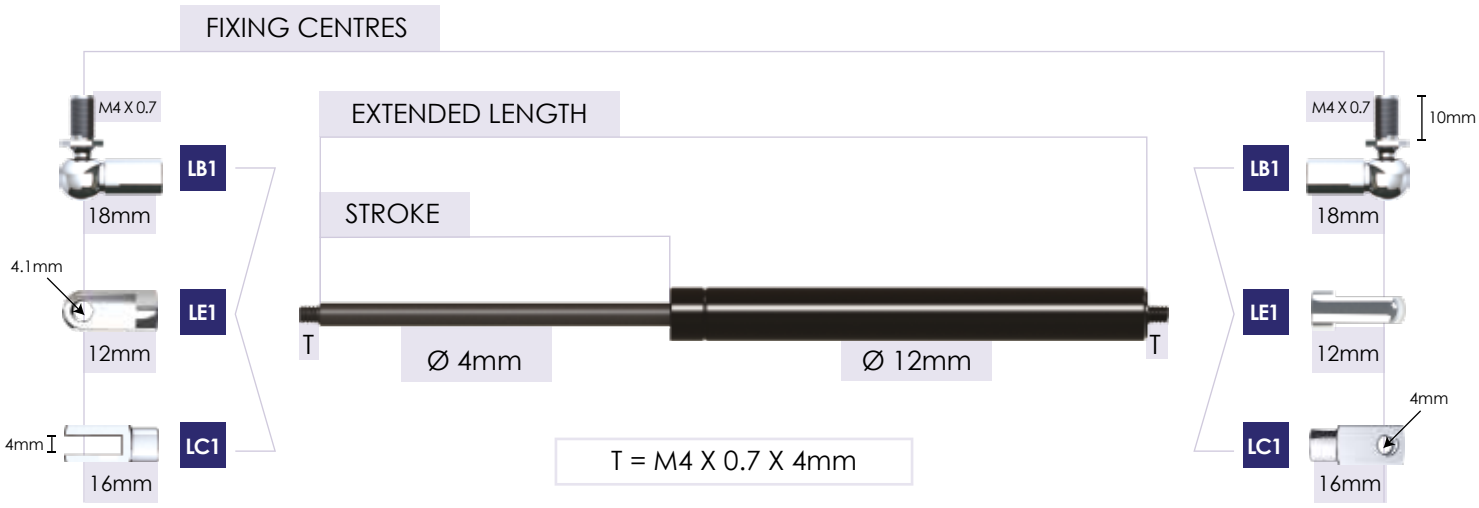
Also available with:

FIXED FORCE

Fixed force gas struts have the force preset at the factory. On delivery they are ready to fit to your application.

Fixed force struts are used where the force of the strut is known, and no further adjustment is required. They are ideal for volume applications where the struts can be fitted without the requirment to adjust the pressure.

The fixed force range is available in mild steel and 316 stainless steel.



Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF**	4 - 20	20	72
	4 - 30	30	92
	4 - 40	40	112
	4 - 50	50	132
	4 - 60	60	152
	4 - 70	70	172
	4 - 80	80	192
	4 - 100	100	232

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	10 - 140N
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

END FITTINGS

CODE	STEEL
BALL JOINTS	LB1
EYE ENDS	LE1
CLEVIS FORKS	LC1

FIXED FORCE
6 - 15 RANGE
STANDARD AND STAINLESS STEEL

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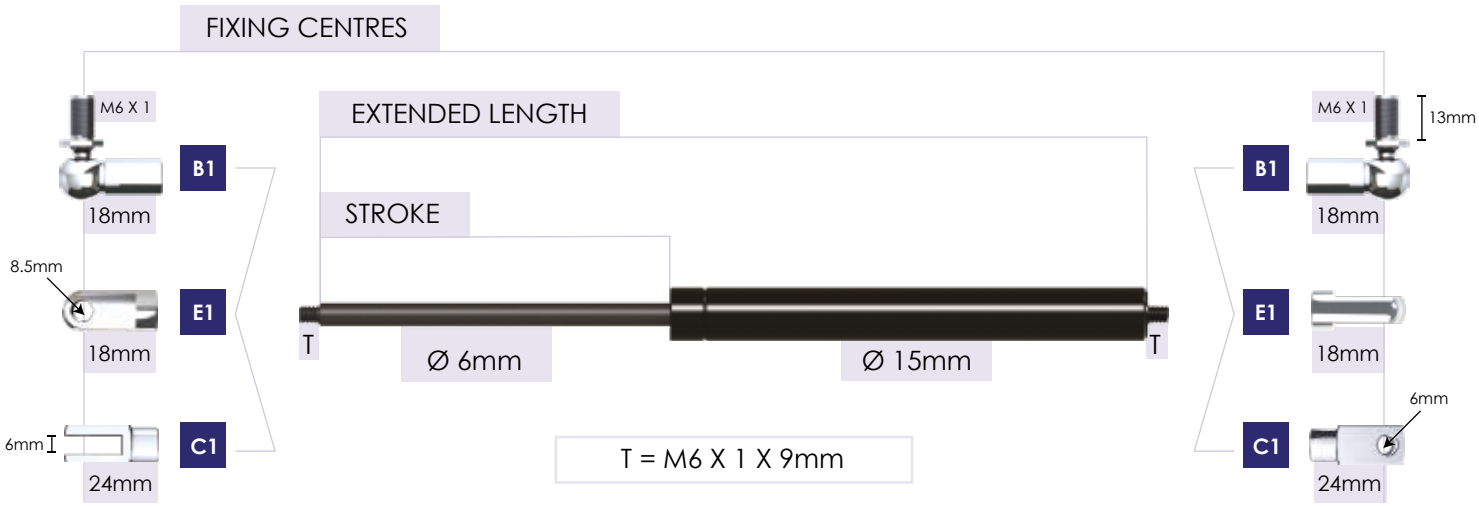


Standard features:

Optional features:

FIXED FORCE
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF** / STAINLESS **NS-SS-FF**	6 - 40	40	115
	6 - 60	60	155
	6 - 80	80	195
	6 - 100	100	235
	6 - 120	120	275
	6 - 150	150	335
	6 - 200	200	435

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	30 - 400N
PANEL WEIGHT: (per pair of struts)	1 - 10kg
FORCE PROGRESSION:	27%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

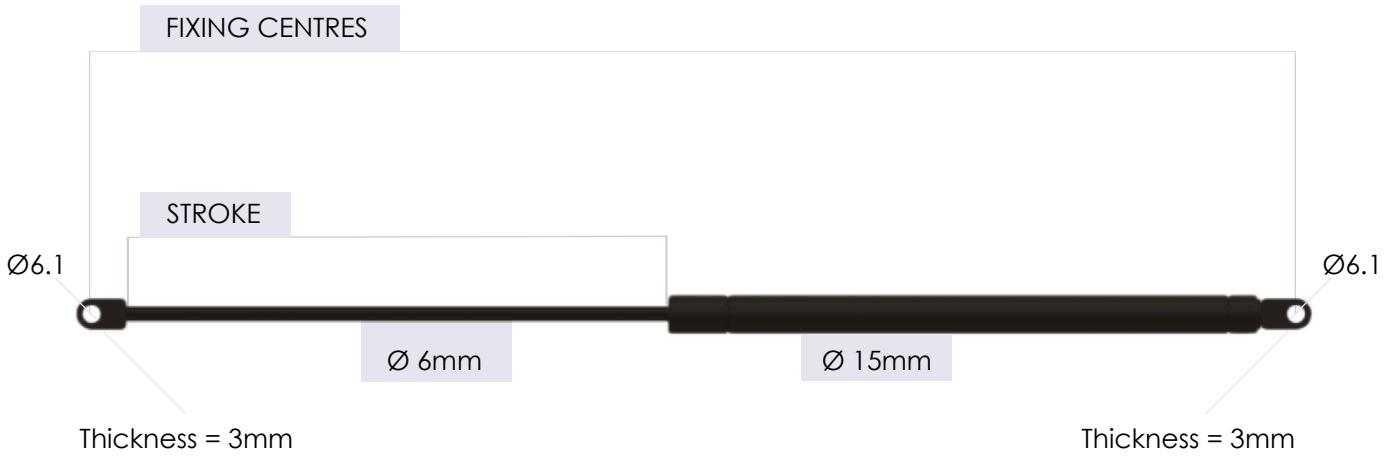
STAINLESS STEEL VARIANT (NS-SS-FF)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B0 - B8	PB1 - PB4	SSB1 - SSB7
EYE ENDS	E0 - E5	-	SSE1 - SSE4
CLEVIS FORKS	C1	-	SSC1



Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	FIXING CENTRES
STEEL **NS-FF-WE**	6 - 20	20	106
	6 - 40	40	146
	6 - 60	60	186
	6 - 80	80	224
	6 - 100	100	264
	6 - 120	120	305.5
	6 - 150	150	366

STANDARD RANGE SPECIFICATION (NS-FF-WE)

FORCE RANGE: (specify when ordering)	50 - 400N
PANEL WEIGHT: (per pair of struts)	1 - 10kg
FORCE PROGRESSION:	27%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

BRACKETS See pages 58 - 66 for our full range

FIXED FORCE
8 - 18 RANGE
STANDARD AND STAINLESS STEEL

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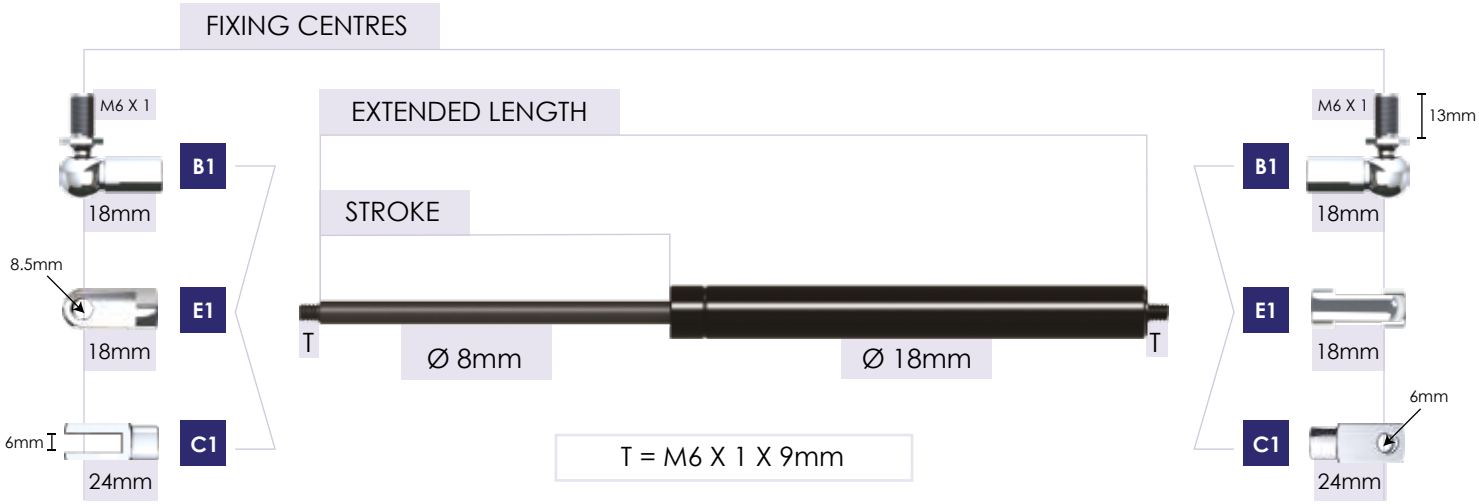


Standard features:

Optional features:

316 PRO LINE

FIXED FORCE
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF** / STAINLESS **NS-SS-FF**	8 - 60	60	165
	8 - 80	80	205
	8 - 100	100	245
	8 - 120	120	285
	8 - 140	140	325
	8 - 150	150	345
	8 - 160	160	365
	8 - 180	180	405
	8 - 200	200	445
	8 - 220	220	485
	8 - 250	250	545
	8 - 280	280	605
	8 - 300	300	645

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	50 - 750N
PANEL WEIGHT: (per pair of struts)	6 - 35kg
FORCE PROGRESSION:	33%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

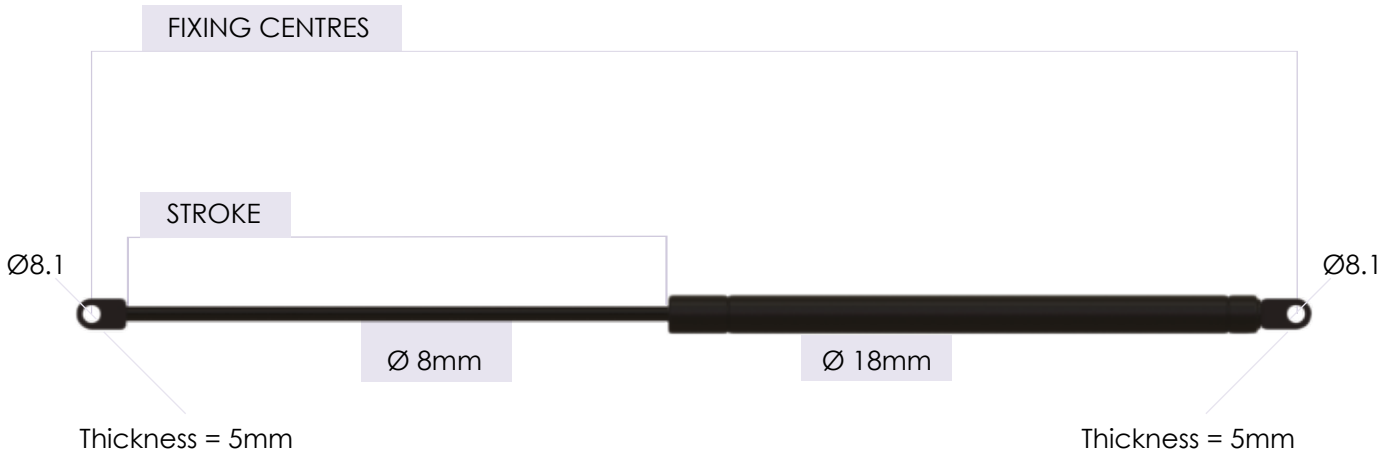
STAINLESS STEEL VARIANT (NS-SS-FF)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B0 - B8	PB1 - PB4	SSB1 - SSB7
EYE ENDS	E0 - E5	-	SSE1 - SSE4
CLEVIS FORKS	C1	-	SSC1



Standard features:

Optional features:

FIXED FORCE

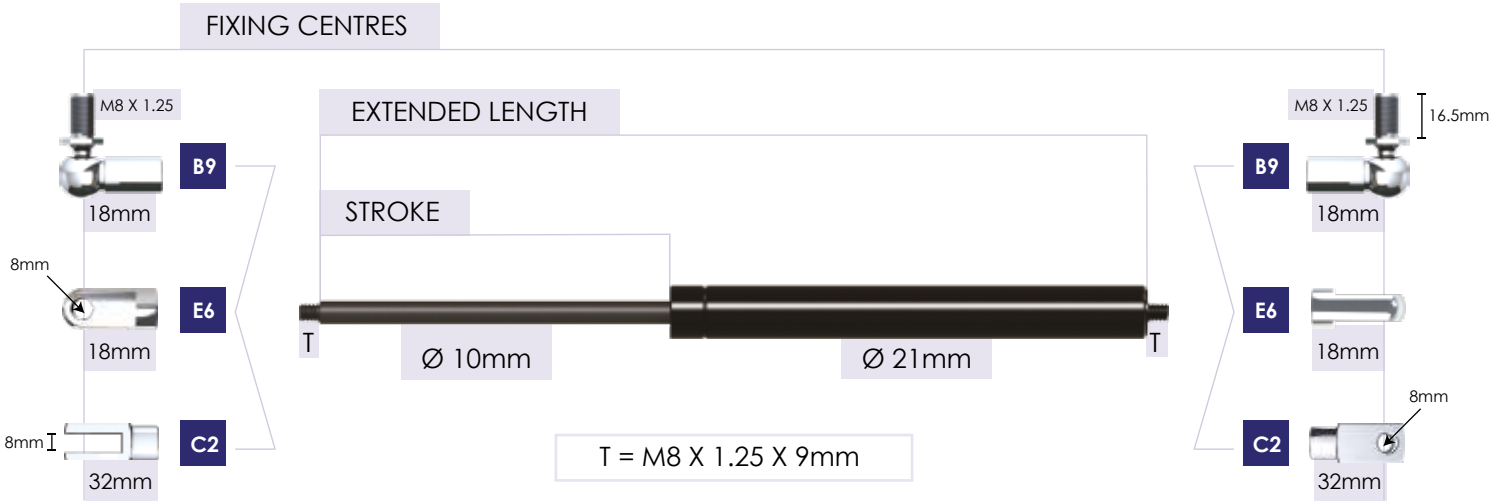
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	FIXING CENTRES
STEEL **NS-FF-WE**	8 - 60	60	206.5
	8 - 80	80	246.5
	8 - 100	100	285.5
	8 - 120	120	326.5
	8 - 140	140	364.5
	8 - 160	160	407.5
	8 - 180	180	447
	8 - 200	200	485.5
	8 - 220	220	525.5
	8 - 250	250	586.5

STANDARD RANGE SPECIFICATION (NS-FF-WE)

FORCE RANGE: (specify when ordering)	100 - 750N
PANEL WEIGHT: (per pair of struts)	6 - 35kg
FORCE PROGRESSION:	33%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

BRACKETS See pages 58 - 66 for our full range



Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF** / STAINLESS **NS-SS-FF**	10 - 100	100	255
	10 - 150	150	355
	10 - 200	200	455
	10 - 250	250	555
	10 - 300	300	655
	10 - 350	350	755
	10 - 400	400	855
	10 - 500	500	1055

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	70 - 1200N
PANEL WEIGHT: (per pair of struts)	25 - 140kg
FORCE PROGRESSION:	39%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

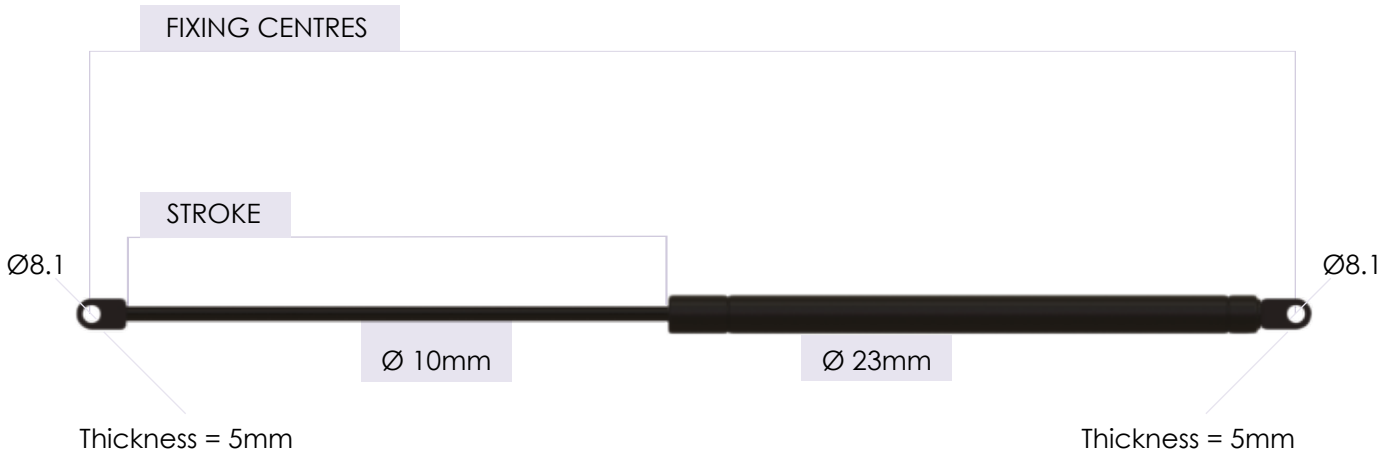
BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B9 - B12	PB5	SSB9 - SSB11
EYE ENDS	E6 - E10	-	SSE6 - SSE10
CLEVIS FORKS	C2	-	SSC2



Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	FIXING CENTRES
STEEL **NS-FF-WE**	10 - 95	95	283
	10 - 145	145	383
	10 - 195	195	483
	10 - 245	245	586
	10 - 295	295	683
	10 - 345	345	783
	10 - 395	395	883

STANDARD RANGE SPECIFICATION (NS-FF-WE)

FORCE RANGE: (specify when ordering)	150 - 1200N
PANEL WEIGHT: (per pair of struts)	25 - 140kg
FORCE PROGRESSION:	39%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

BRACKETS See pages 58 - 66 for our full range

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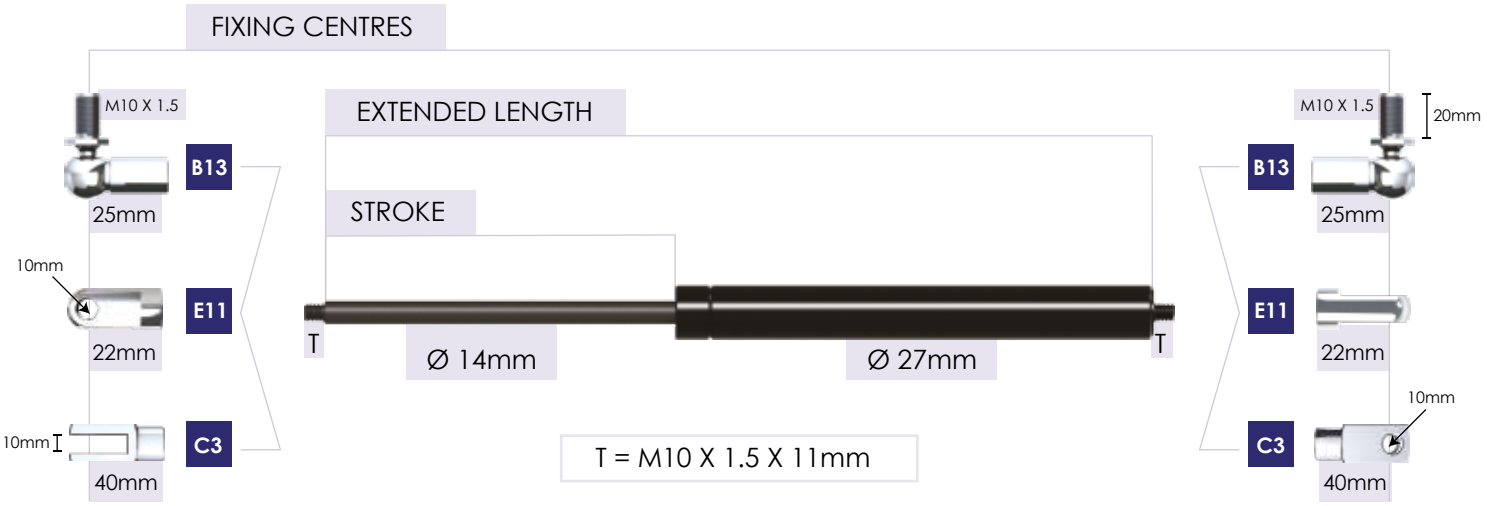


Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF** / STAINLESS **NS-SS-FF**	14 - 100	100	255
	14 - 150	150	355
	14 - 200	200	455
	14 - 250	250	555
	14 - 300	300	655
	14 - 350	350	755
	14 - 400	400	855
	14 - 450	450	955
	14 - 500	500	1055

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	150 - 2500N
PANEL WEIGHT: (per pair of struts)	100 - 350kg
FORCE PROGRESSION:	52%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

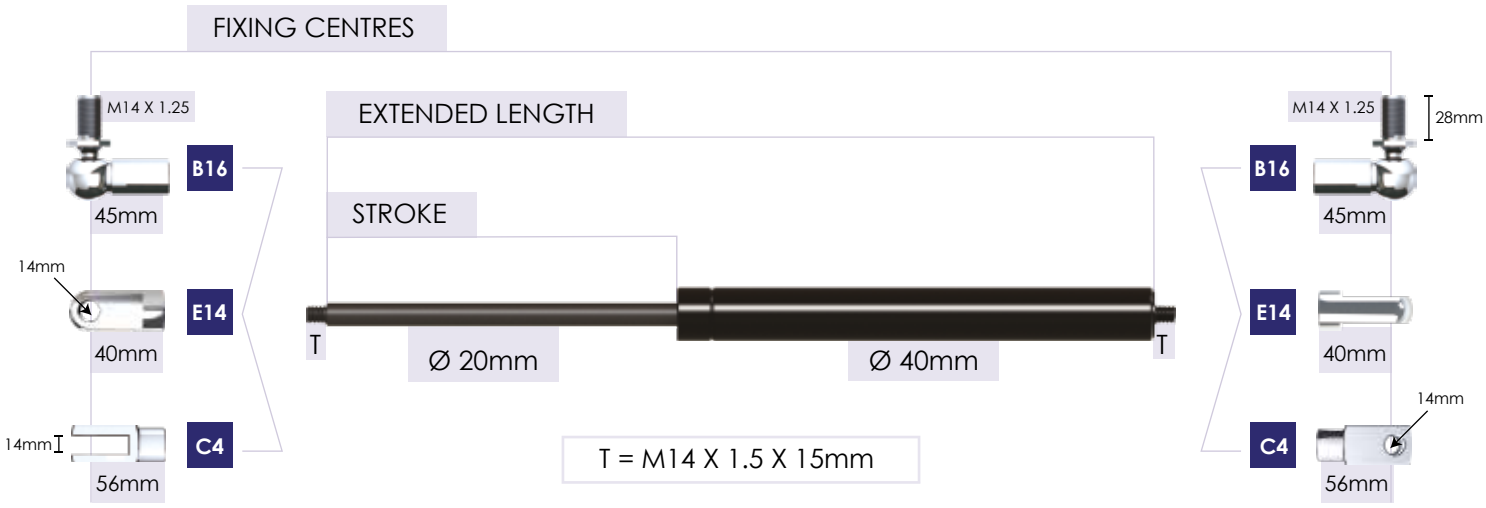
BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B13 - B15-A	-	SSB15
EYE ENDS	E11 - E13	-	SSE13
CLEVIS FORKS	C3	-	SSC3



Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF** / STAINLESS **NS-SS-FF**	20 - 100	100	277
	20 - 150	150	377
	20 - 200	200	477
	20 - 250	250	577
	20 - 300	300	677
	20 - 350	350	777
	20 - 400	400	877
	20 - 450	450	977
	20 - 500	500	1077
	20 - 600	600	1277
	20 - 700	700	1477
	20 - 800	800	1677

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	300 - 5000N
PANEL WEIGHT: (per pair of struts)	300 - 500kg
FORCE PROGRESSION:	45%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

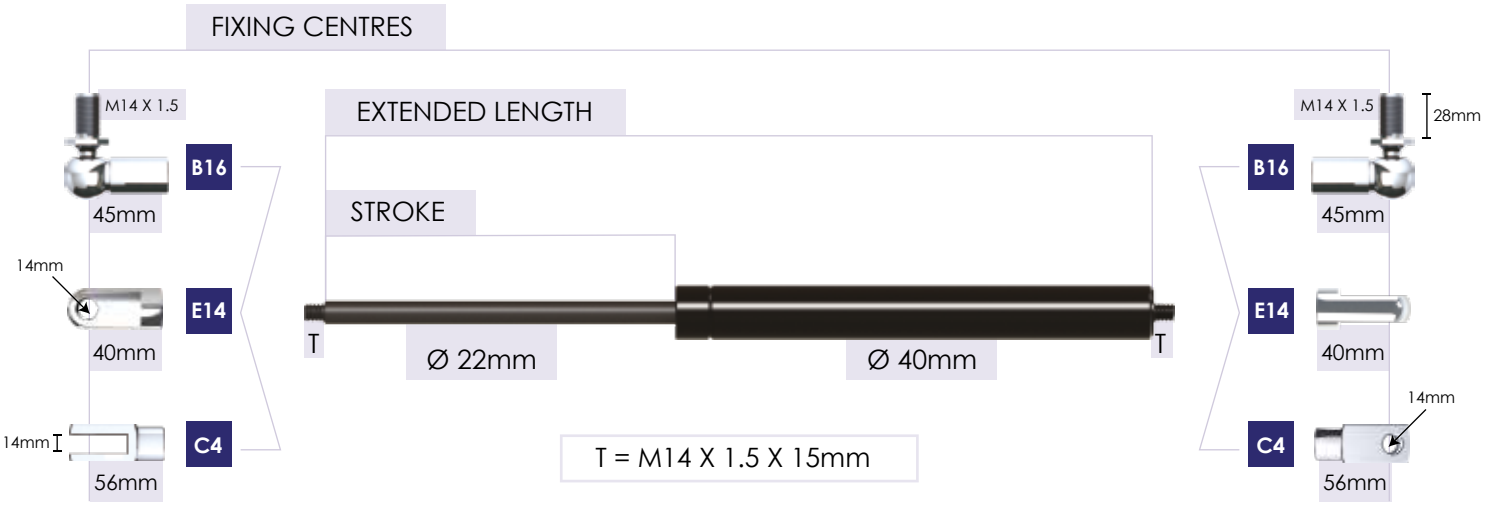
BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B16	-	-
EYE ENDS	E14	-	-
CLEVIS FORKS	C4	-	-



Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF** / STAINLESS **NS-SS-FF**	22 - 100	100	271
	22 - 150	150	371
	22 - 200	200	471
	22 - 250	250	571
	22 - 300	300	671
	22 - 350	350	771
	22 - 400	400	871
	22 - 450	450	971
	22 - 500	500	1071
	22 - 600	600	1271
	22 - 700	700	1471
	22 - 800	800	1671

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	500 - 6000N
PANEL WEIGHT: (per pair of struts)	500 - 600kg
FORCE PROGRESSION:	48%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

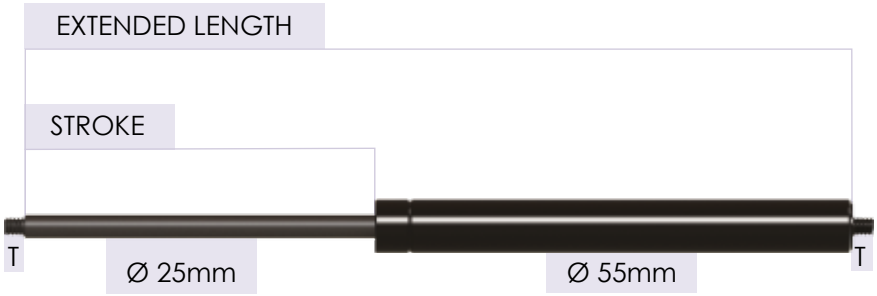
BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B16	-	-
EYE ENDS	E14	-	-
CLEVIS FORKS	C4	-	-



T = M20 X 2.5 X 30mm

Standard features:

Optional features:

FIXED FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-FF** / STAINLESS **NS-SS-FF**	25 - 100	100	288
	25 - 150	150	388
	25 - 200	200	488
	25 - 250	250	588
	25 - 300	300	688
	25 - 350	350	788
	25 - 400	400	888

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-FF)

FORCE RANGE: (specify when ordering)	500 - 7500N
PANEL WEIGHT: (per pair of struts)	500 - 750kg
FORCE PROGRESSION:	45%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

END FITTINGS

End fittings available upon request

HOW TO ORDER

Use SS for stainless steel variant

STANDARD	NS-V	6	60	B1	E1	400N
STAINLESS STEEL	NS-SS-V					

ROD Ø
STROKE
ROD END FITTING
TUBE END FITTING
FORCE

Also available with:

VARIABLE FORCE

Variable struts are delivered at maximum pressure, this can be reduced through a side valve to suit the application. Variable struts are ideal for prototypes, bespoke jobs or applications where a single model of strut is used on a variety of lids, or hatches that require different pressures.

The variable force compression and traction struts have the release valve located on the side of the cylinder for easier adjustment when the strut is in situ.

These struts, if degassed too much will need to be returned to the factory for regassing.

For pro-line struts, the valve is located in the thread, the end fitting must be removed and a special degassing tool must be used to reduce the pressure. This type of strut can be re-gassed with special equipment or be returned to the factory for re-gassing.

Variable struts are available in mild steel and stainless 316. When ordering the stainless steel variant please remember to add 5mm to the body length.

VARIABLE FORCE

FORCE ADJUSTMENT INSTRUCTIONS

- Fit the gas struts with the cylinder uppermost; this prevents oil escaping while venting, and keeps the internal seals lubricated for optimum lifespan.
- Using the allen key provided, undo the grub screw anti-clockwise a quarter turn and vent gas for 1 second, retightening the grub screw. Do not over tighten the grub screw.
- Repeat this process on the second gas strut, venting an equal amount. Only release the pressure in short bursts to avoid venting too much gas. Each 1 second burst will lower the force by approximately 20N - 50N depending on the range.
- Test the application by attempting to close the panel and repeat the venting process if the struts are still too powerful.
- Once the gas struts have been adjusted, gently brush the grub screw with washing up liquid. If gas can be seen bubbling through the liquid then the grub screw requires further tightening.

For advice on how to safely mount gas struts call our technical line: **01604 499332**.

Gas struts are filled with high pressure nitrogen, they should be protected from damage; never open, modify, drill, weld or subject gas struts to excessive heat.

VARIABLE FORCE
6 - 15 RANGE
STANDARD AND STAINLESS STEEL

METROL

Standard features:

Optional features:

VARIABLE FORCE
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-V**	6 - 60	60	160
	6 - 100	100	240
STAINLESS **NS-SS-V**	6 - 150	150	340
	6 - 200	200	440

STANDARD RANGE SPECIFICATION (NS-V)

FORCE RANGE: (specify when ordering)	30 - 400N
PANEL WEIGHT: (per pair of struts)	1 - 10kg
FORCE PROGRESSION:	27%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

Supplied at maximum force unless specified otherwise

STAINLESS STEEL VARIANT (NS-SS-V)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B0 - B8	PB1 - PB4	SSB1 - SSB7
EYE ENDS	E0 - E5	-	SSE1 - SSE4
CLEVIS FORKS	C1	-	SSC1

Standard features:

Optional features:

VARIABLE FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-V** / STAINLESS **NS-SS-V**	8 - 100	100	250
	8 - 120	120	290
	8 - 150	150	350
	8 - 180	180	410
	8 - 200	200	450
	8 - 250	250	550
	8 - 300	300	650

STANDARD RANGE SPECIFICATION (NS-V)

FORCE RANGE: (specify when ordering)	50 - 650N
PANEL WEIGHT: (per pair of struts)	6 - 35kg
FORCE PROGRESSION:	33%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

Supplied at maximum force unless specified otherwise

STAINLESS STEEL VARIANT (NS-SS-V)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B0 - B8	PB1 - PB4	SSB1 - SSB7
EYE ENDS	E0 - E5	-	SSE1 - SSE4
CLEVIS FORKS	C1	-	SSC1

VARIABLE FORCE
10 - 21 RANGE
STANDARD AND STAINLESS STEEL

METROL

Standard features:

Optional features:

VARIABLE FORCE
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-V**	10 - 100	100	250
	10 - 150	150	350
STAINLESS **NS-SS-V**	10 - 200	200	450
	10 - 250	250	550
	10 - 300	300	650
	10 - 350	350	750
	10 - 400	400	850
	10 - 500	500	1050

STANDARD RANGE SPECIFICATION (NS-V)

FORCE RANGE: (specify when ordering)	70 - 1200N
PANEL WEIGHT: (per pair of struts)	25 - 140kg
FORCE PROGRESSION:	39%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

Supplied at maximum force unless specified otherwise

STAINLESS STEEL VARIANT (NS-SS-V)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B9 - B12	PB5	SSB9 - SSB11
EYE ENDS	E6 - E10	-	SSE6 - SSE10
CLEVIS FORKS	C2	-	SSC2

Standard features:

Optional features:

VARIABLE FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-V** / STAINLESS **NS-SS-V**	14 - 100	100	280
	14 - 150	150	380
	14 - 200	200	480
	14 - 250	250	580
	14 - 300	300	680
	14 - 350	350	780
	14 - 400	400	880
	14 - 500	500	1080
	14 - 600	600	1280

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-V)

FORCE RANGE: (specify when ordering)	150 - 2500N
PANEL WEIGHT: (per pair of struts)	100 - 350kg
FORCE PROGRESSION:	52%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

Supplied at maximum force unless specified otherwise

STAINLESS STEEL VARIANT (NS-SS-V)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B13 - B15-A	-	SSB15
EYE ENDS	E11 - E13	-	SSE13
CLEVIS FORKS	C3	-	SSC3

VARIABLE FORCE
20 - 40 RANGE
STANDARD AND STAINLESS STEEL

METROL

Standard features:

Optional features:

VARIABLE FORCE
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-V** STAINLESS **NS-SS-V**	20 - 100	100	311
	20 - 150	150	411
	20 - 200	200	511
	20 - 250	250	611
	20 - 300	300	711
	20 - 350	350	811
	20 - 400	400	911
	20 - 450	450	1011
	20 - 500	500	1111
	20 - 600	600	1311
	20 - 700	700	1511
	20 - 800	800	1711

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-V)

FORCE RANGE: (specify when ordering)	300 - 5000N
PANEL WEIGHT: (per pair of struts)	300 - 500kg
FORCE PROGRESSION:	45%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

Supplied at maximum force unless specified otherwise

STAINLESS STEEL VARIANT (NS-SS-V)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B16	-	-
EYE ENDS	E14	-	-
CLEVIS FORKS	C4	-	-

Standard features:

Optional features:

VARIABLE FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-V** / STAINLESS **NS-SS-V**	22 - 100	100	271
	22 - 150	150	371
	22 - 200	200	471
	22 - 250	250	571
	22 - 300	300	671
	22 - 350	350	771
	22 - 400	400	871
	22 - 450	450	971
	22 - 500	500	1071
	22 - 600	600	1271
	22 - 700	700	1471
	22 - 800	800	1671

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-V)

FORCE RANGE: (specify when ordering)	500 - 6000N
PANEL WEIGHT: (per pair of struts)	500 - 600kg
FORCE PROGRESSION:	48%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

Supplied at maximum force unless specified otherwise

STAINLESS STEEL VARIANT (NS-SS-V)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

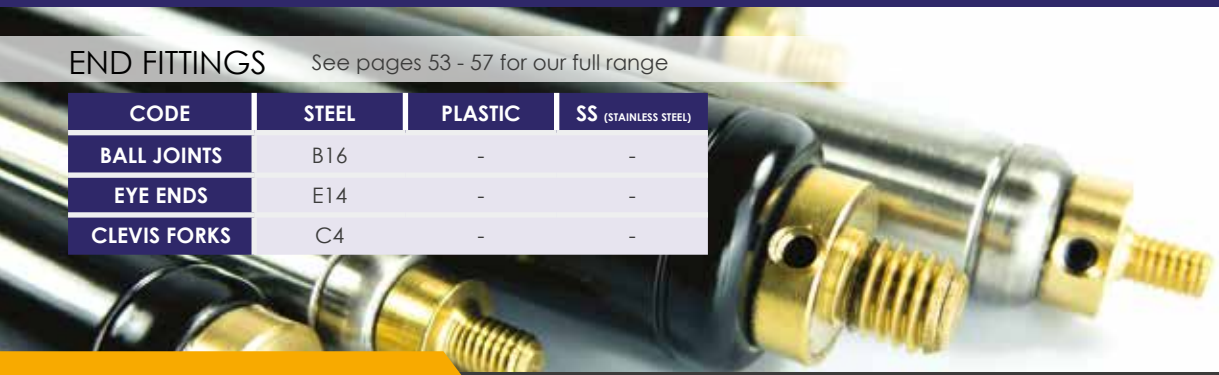
BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B16	-	-
EYE ENDS	E14	-	-
CLEVIS FORKS	C4	-	-



T = M20 X 2.5 X 30mm

Standard features:

Optional features:

VARIABLE FORCE

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	EXTENDED LENGTH (EL)
STEEL **NS-V** STAINLESS **NS-SS-V**	25 - 100	100	288
	25 - 150	150	388
	25 - 200	200	488
	25 - 250	250	588
	25 - 300	300	688
	25 - 350	350	788
	25 - 400	400	888

Please call for details on longer stroke sizes

STANDARD RANGE SPECIFICATION (NS-V)

FORCE RANGE: (specify when ordering)	800 - 7500N
PANEL WEIGHT: (per pair of struts)	500 - 750kg
FORCE PROGRESSION:	45%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

Supplied at maximum force unless specified otherwise

STAINLESS STEEL VARIANT (NS-SS-V)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

END FITTINGS

End fittings available upon request

HOW TO ORDER

Use SS for stainless steel variant

STANDARD NS-V-TR

STAINLESS STEEL NS-SS-V-TR

6	100	B1	E1	150N
ROD Ø	STROKE	ROD END FITTING	TUBE END FITTING	FORCE

Also available with:

TRACTION

Traction struts operate in the opposite way to conventional push type gas struts and are also known as pull type gas struts.

Installed in the "closed" position, opening the application causes the gas strut to extend, the gas strut force tries to close the application back to its resting state.

When ordering the stainless steel variant of the variable force traction strut, please remember to add 5mm to the body length.

Advantages

Traction gas struts are ideal when the application involves a flap or lid that opens with gravity and requires a force to close. They are easy to fit and adjustable if using the variable type.

FIXED TRACTION
6 - 18 RANGE
STANDARD AND STAINLESS STEEL

METROL

Optional features:

316 PRO LINE

FIXED TRACTION
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	LENGTH (EL)	
			COMPRESSED	EXTENDED
STEEL **NS-FF-TR**	6 - 100	100	164	249
	6 - 150	150	214	349
STAINLESS **NS-SS-FF-TR**	6 - 200	200	264	449

STANDARD RANGE SPECIFICATION (NS-FF-TR)

FORCE RANGE: (specify when ordering)	50 - 300N
PANEL WEIGHT: (per pair of struts)	1 - 10kg
FORCE PROGRESSION:	50%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF-TR)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B0 - B8	PB1 - PB4	SSB1 - SSB7
EYE ENDS	E0 - E5	-	SSE1 - SSE4
CLEVIS FORKS	C1	-	SSC1

Optional features:

VARIABLE TRACTION

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	LENGTH (EL) COMPRESSED	LENGTH (EL) EXTENDED
STEEL **NS-FF-TR** / STAINLESS **NS-SS-FF-TR**	8 - 100	100	165	265
	8 - 150	150	215	365
	8 - 200	200	265	465
	8 - 250	250	315	565
	8 - 300	300	365	665

STANDARD RANGE SPECIFICATION (NS-FF-TR)

FORCE RANGE: (specify when ordering)	100 - 400N
PANEL WEIGHT: (per pair of struts)	6 - 35kg
FORCE PROGRESSION:	60%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF-TR)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B9 - B12	PB5	SSB9 - SSB11
EYE ENDS	E6 - E10	-	SSE6 - SSE10
CLEVIS FORKS	C2	-	SSC2

FIXED TRACTION
10 - 28 RANGE
STANDARD AND STAINLESS STEEL

Optional features:

VARIABLE TRACTION
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	LENGTH (EL) COMPRESSED	LENGTH (EL) EXTENDED
STEEL **NS-FF-TR** / STAINLESS **NS-SS-FF-TR**	10 - 100	100	197	282
	10 - 150	150	247	382
	10 - 200	200	297	482
	10 - 250	250	347	582
	10 - 300	300	397	682
	10 - 400	400	497	882

STANDARD RANGE SPECIFICATION (NS-FF-TR)

FORCE RANGE: (specify when ordering)	200 - 1200N
PANEL WEIGHT: (per pair of struts)	25 - 140kg
FORCE PROGRESSION:	50%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF-TR)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B13 - B15-A	-	SSB15
EYE ENDS	E11 - E13	-	SSE13
CLEVIS FORKS	C3	-	SSC3

Optional features:

VARIABLE TRACTION

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	LENGTH (EL) COMPRESSED	LENGTH (EL) EXTENDED
STEEL **NS-FF-TR** STAINLESS **NS-SS-FF-TR**	14 - 100	100	216	301
	14 - 150	150	266	401
	14 - 200	200	316	501
	14 - 250	250	366	601
	14 - 300	300	416	701
	14 - 400	400	516	901
	14 - 500	500	616	1101
	14 - 600	600	716	1301

STANDARD RANGE SPECIFICATION (NS-FF-TR)

FORCE RANGE: (specify when ordering)	300 - 4000N
PANEL WEIGHT: (per pair of struts)	100 - 350kg
FORCE PROGRESSION:	55%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF-TR)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B13 - B15-A	-	SSB15
EYE ENDS	E11 - E13	-	SSE13
CLEVIS FORKS	C3	-	SSC3

VARIABLE TRACTION
8 - 22 RANGE
STANDARD AND STAINLESS STEEL

Standard features:

Optional features:

VARIABLE TRACTION
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	LENGTH (EL) COMPRESSED	LENGTH (EL) EXTENDED
STEEL **NS-V-TR**	8 - 100	100	190	290
	8 - 150	150	240	390
STAINLESS **NS-SS-V-TR**	8 - 200	200	290	490
	8 - 250	250	340	590

STANDARD RANGE SPECIFICATION (NS-V-TR)

FORCE RANGE: (specify when ordering)	50 - 650N
PANEL WEIGHT: (per pair of struts)	6 - 35kg
FORCE PROGRESSION:	60%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-V-TR)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B9 - B12	PB5	SSB9 - SSB11
EYE ENDS	E6 - E10	-	SSE6 - SSE10
CLEVIS FORKS	C2	-	SSC2

Standard features:

Optional features:

VARIABLE TRACTION

Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	LENGTH (EL) COMPRESSED	LENGTH (EL) EXTENDED
STEEL **NS-V-TR** / STAINLESS **NS-SS-V-TR**	10 - 100	100	200	300
	10 - 150	150	250	400
	10 - 200	200	300	500
	10 - 250	250	350	600
	10 - 300	300	400	700
	10 - 400	400	500	900
	10 - 500	500	600	1100

STANDARD RANGE SPECIFICATION (NS-V-TR)

FORCE RANGE: (specify when ordering)	150 - 1500N
PANEL WEIGHT: (per pair of struts)	25 - 140kg
FORCE PROGRESSION:	50%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-V-TR)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B13 - B15-A	-	SSB15
EYE ENDS	E11 - E13	-	SSE13
CLEVIS FORKS	C3	-	SSC3

VARIABLE TRACTION
14 - 40 RANGE
STANDARD AND STAINLESS STEEL

Standard features:

Optional features:

VARIABLE TRACTION
Custom sizes available on request

CODE	STRUT REFERENCE	STROKE (S)	LENGTH (EL) COMPRESSED	LENGTH (EL) EXTENDED
STEEL **NS-V-TR** STAINLESS **NS-SS-V-TR**	14 - 100	100	216	301
	14 - 150	150	266	401
	14 - 200	200	316	501
	14 - 250	250	366	601
	14 - 300	300	416	701
	14 - 400	400	516	901
	14 - 500	500	616	1101
	14 - 600	600	716	1301
	14 - 700	700	816	1501
	14 - 800	800	916	1701
	14 - 900	900	1016	1901
	14 - 1000	1000	1116	2101

STANDARD RANGE SPECIFICATION (NS-V-TR)

FORCE RANGE: (specify when ordering)	300 - 4000N
PANEL WEIGHT: (per pair of struts)	100 - 350kg
FORCE PROGRESSION:	55%
WORKING TEMPERATURE RANGE:	-30°C to +80°C
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-V-TR)

ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

BRACKETS
See pages 58 - 66 for our full range

END FITTINGS
See pages 53 - 57 for our full range

CODE	STEEL	PLASTIC	SS (STAINLESS STEEL)
BALL JOINTS	B13 - B15-A	-	SSB15
EYE ENDS	E11 - E13	-	SSE13
CLEVIS FORKS	C3	-	SSC3

HOW TO ORDER

Use SS for stainless steel variant

STANDARD NS-FF-P-E

STAINLESS STEEL NS-SS-FF-P-E

8	100	PRH01-1	E6	700N
ROD Ø	STROKE	ROD END FITTING	TUBE END FITTING	FORCE

Also available with:

PIN LOCKING

Locking gas struts utilise an internal mechanism to lock the rod at a set position in the stroke range. This can be very useful where variable adjustment of an application is required such as medical beds and chairs.

There are two main types of locking;

- Elastic – when locked in position the piston rod has a small amount of movement, similar to an office chair.
- Rigid – when locked in position no movement of the piston rod can occur.

The locking type can be set for the travel direction:

- Elastic in compression and extension
- Rigid in compression and extension
- Rigid in compression only
- Rigid in extension only

Movement of the rod can only occur when the pin is depressed, this can be done with a lever attached directly to the strut or can be remotely controlled with a Bowden cable, using a variety of levers, and push buttons.

When ordering the stainless steel variant of the variable force pin locking strut, please remember to add 5mm to the body length.

METROL

EXAMPLE SHOWN: 8 - 21 VARIANT WITH M8 THREAD

Standard features:

Optional features:

CUSTOM STRUT ORDERING

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-FF-P-E/ NS-SS-FF-P-E	8	21	10 - 300mm	stroke x 2 + 20	M8x1, M8x1.25		23%	80 - 700N
	8	27	10 - 300mm	stroke x 2 + 20	M8x1, M8x1.25		13%	80 - 700N

STEEL / STAINLESS	ROD	BODY	STROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-FF-P-E/ NS-SS-FF-P-E	10	21	10 - 500mm	stroke x 2 + 70	M10x1, M10x1.5		39%	80 - 1300N
	10	27	10 - 500mm	stroke x 2 + 70	M10x1, M10x1.5		21%	80 - 1300N

STANDARD RANGE SPECIFICATION (NS-FF-P-E)

PANEL WEIGHT FOR 8-21 & 8-27:	6 - 35kg per pair
PANEL WEIGHT FOR 10-21 & 10-27:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°C to +80°C
PIN POSITION:	ROD / BODY
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF-P-E)

COMPATIBLE RANGES:	10-21, 10-27
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

PIN RELEASE HEAD END FITTINGS **See pages 67 - 73**

BOWDEN CABLES **Available in custom sizes**

PIN LOCKING
RIGID IN BOTH DIRECTIONS
STANDARD AND STAINLESS STEEL

EXAMPLE SHOWN: 8 - 21 VARIANT WITH M8 THREAD

Standard features:

Optional features:

CUSTOM STRUT ORDERING

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-FF-P-R/ NS-SS-FF-P-R	10	21	50 - 250mm	stroke x 3 + 80	M10x1, M10x1.5		140%	50 - 1200N
	10	27	50 - 250mm	stroke x 3 + 85	M10x1, M10x1.5		130%	50 - 1200N

8-21 & 8-27 struts available upon request.

STANDARD RANGE SPECIFICATION (NS-FF-P-R)

PANEL WEIGHT FOR 10-21 & 10-27:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°C to +80°C
PIN POSITION:	ROD / BODY
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 YEARS

STAINLESS STEEL VARIANT (NS-SS-FF-P-R)

COMPATIBLE RANGES:	10-21, 10-27
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

PIN RELEASE HEAD END FITTINGS **See pages 67 - 73**

BOWDEN CABLES **Available in custom sizes**

EXAMPLE SHOWN: 8 - 21 VARIANT WITH M8 THREAD

Standard features:

Optional features:

CUSTOM STRUT ORDERING

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-FF-P-RE/ NS-SS-FF-P-RE	8	21	10 - 300mm	stroke x 2.52 + 85	M8x1, M8x1.25		35%	40 - 700N
				stroke x 2.37 + 85			50%	
				stroke x 2.19 + 85			100%	
	8	27	10 - 300mm	stroke x 2.33 + 86	M8x1, M8x1.25		35%	40 - 700N
				stroke x 2.24 + 86			50%	
				stroke x 2.13 + 86			100%	

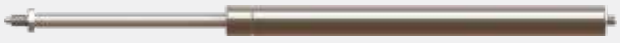
STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-FF-P-RE/ NS-SS-FF-P-RE	10	21	10 - 500mm	stroke x 2.81 + 86	M10x1, M10x1.5		35%	50 - 1300N
				stroke x 2.58 + 86			50%	
				stroke x 2.30 + 86			100%	
	10	27	10 - 500mm	stroke x 2.52 + 86	M10x1, M10x1.5		35%	50 - 1300N
				stroke x 2.36 + 86			50%	
				stroke x 2.19 + 86			100%	

STANDARD RANGE SPECIFICATION (NS-FF-P-RE)

PANEL WEIGHT FOR 8-21 & 8-27:	6 - 35kg per pair
PANEL WEIGHT FOR 10-21 & 10-27:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
PIN POSITION:	ROD / BODY
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

STAINLESS STEEL VARIANT (NS-SS-FF-P-RE)

COMPATIBLE RANGES:	10-21, 10-27
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)



PIN RELEASE HEAD END FITTINGS **See pages 67 - 73**

BOWDEN CABLES **Available in custom sizes**

EXAMPLE SHOWN: 8 - 21 VARIANT WITH M8 THREAD

Standard features:

Optional features:

CUSTOM STRUT ORDERING

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-FF-P-RC/ NS-SS-FF-P-RC	8	21	30 - 200mm	stroke x 2.83 + 84	M8x1, M8x1.25		35%	40 - 700N
				stroke x 2.69 + 84			50%	
				stroke x 2.49 + 84			100%	
	8	27	30 - 200mm	stroke x 2.50 + 80	M8x1, M8x1.25		35%	40 - 700N
				stroke x 2.40 + 80			50%	
				stroke x 2.30 + 80			100%	

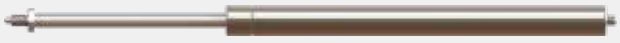
STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-FF-P-RC/ NS-SS-FF-P-RC	10	21	30 - 300mm	stroke x 3.46 + 84	M10x1, M10x1.5		35%	50 - 1300N
				stroke x 3.15 + 84			50%	
				stroke x 2.85 + 84			100%	
	10	27	30 - 300mm	stroke x 2.81 + 80	M10x1, M10x1.5		35%	50 - 1300N
				stroke x 2.65 + 80			50%	
				stroke x 2.42 + 80			100%	

STANDARD RANGE SPECIFICATION (NS-FF-P-RC)

PANEL WEIGHT FOR 8-21 & 8-27:	6 - 35kg per pair
PANEL WEIGHT FOR 10-21 & 10-27:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
PIN POSITION:	ROD / BODY
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

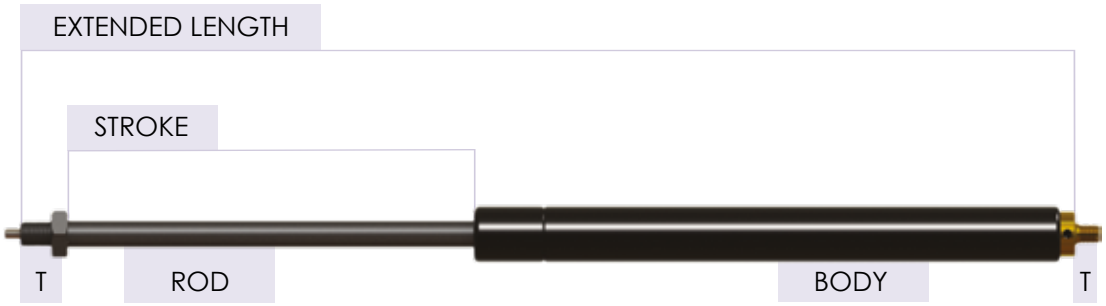
STAINLESS STEEL VARIANT (NS-SS-FF-P-RC)

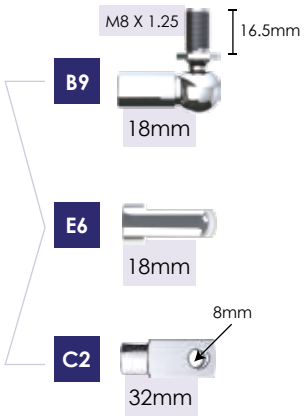
COMPATIBLE RANGES:	10-21, 10-27
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)



PIN RELEASE HEAD END FITTINGS **See pages 67 - 73**

BOWDEN CABLES **Available in custom sizes**





EXAMPLE SHOWN: 8 - 21 VARIANT WITH M8 THREAD

Standard features:

Optional features:

CUSTOM STRUT ORDERING

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-V-P-E/ NS-SS-V-P-E	8	21	10 - 300mm	stroke x 2 + 78.50	M8x1, M8x1.25		23%	80 - 700N
	8	27	10 - 300mm	stroke x 2 + 79.50	M8x1, M8x1.25		13%	80 - 700N

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-V-P-E/ NS-SS-V-P-E	10	21	10 - 500mm	stroke x 2 + 78.50	M10x1, M10x1.5		39%	80 - 1300N
	10	27	10 - 500mm	stroke x 2 + 79.50	M10x1, M10x1.5		21%	80 - 1300N

STANDARD RANGE SPECIFICATION (NS-V-P-E)

PANEL WEIGHT FOR 8-21 & 8-27:	6 - 35kg per pair
PANEL WEIGHT FOR 10-21 & 10-27:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
PIN POSITION:	ROD / BODY
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

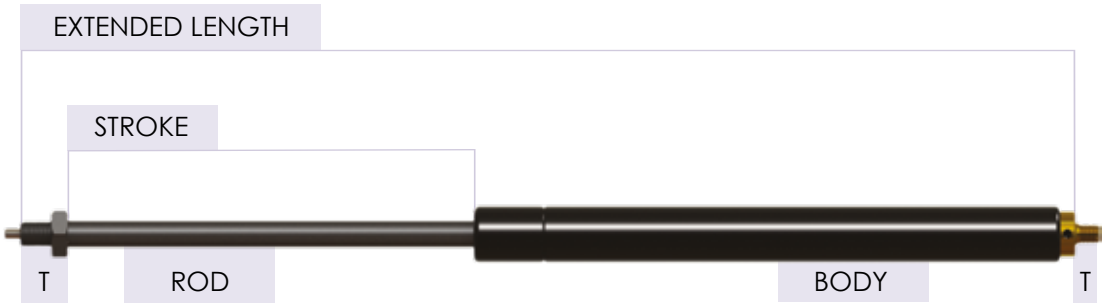
STAINLESS STEEL VARIANT (NS-SS-V-P-E)

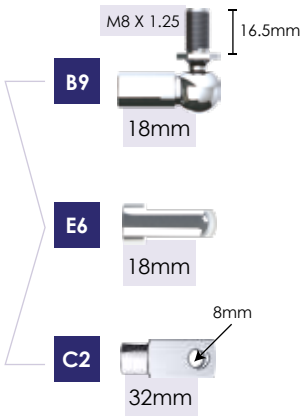
COMPATIBLE RANGES:	10-21, 10-27
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

PIN RELEASE HEAD END FITTINGS **See pages 67 - 73**

BOWDEN CABLES **Available in custom sizes**





EXAMPLE SHOWN: 8 - 21 VARIANT WITH M8 THREAD

Standard features:

Optional features:

CUSTOM STRUT ORDERING

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-V-P-RE/ NS-SS-V-P-RE	8	21	10 - 300mm	stroke x 2.52 + 93.50	M8x1, M8x1.25		35%	40 - 700N
				stroke x 2.37 + 93.50			50%	
				stroke x 2.19 + 93.50			100%	
	8	27	10 - 300mm	stroke x 2.33 + 95.50	M8x1, M8x1.25		35%	40 - 700N
				stroke x 2.24 + 95.50			50%	
				stroke x 2.13 + 95.50			100%	

STEEL / STAINLESS	ROD	BODY	SROKE RANGE	EXT. LENGTH CALCULATION	ROD END	BODY END	FORCE INCREASE	FORCE RANGE
NS-V-P-RE/ NS-SS-V-P-RE	10	21	10 - 500mm	stroke x 2.81 + 94.50	M10x1, M10x1.5		35%	50 - 1300N
				stroke x 2.58 + 94.50			50%	
				stroke x 2.30 + 94.50			100%	
	10	27	10 - 500mm	stroke x 2.52 + 95.50	M10x1, M10x1.5		35%	50 - 1300N
				stroke x 2.36 + 95.50			50%	
				stroke x 2.19 + 95.50			100%	

STANDARD RANGE SPECIFICATION (NS-V-P-RE)

PANEL WEIGHT FOR 8-21 & 8-27:	6 - 35kg per pair
PANEL WEIGHT FOR 10-21 & 10-27:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
PIN POSITION:	ROD / BODY
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

STAINLESS STEEL VARIANT (NS-SS-V-P-RE)

COMPATIBLE RANGES:	10-21, 10-27
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

PIN RELEASE HEAD END FITTINGS **See pages 67 - 73**

BOWDEN CABLES **Available in custom sizes**

HOW TO ORDER

Use SS for stainless steel variant

STANDARD NS-FF-M-E

STAINLESS STEEL NS-SS-FF-M-E

10	250	B9	E6	800N
ROD Ø	STROKE	ROD END FITTING	TUBE END FITTING	FORCE

Also available with:

MECHANICAL LOCKING

Mechanical locking struts have a unique mechanism which allows the strut to be either locked in the fully extended position, or the fully compressed position.

Locking in the fully extended position eliminates the need for additional locking tubes. The mechanical lock will keep the rod fully extended if the gas struts should lose pressure. The other advantage is that if the strut is used to raise an object to a certain level that may then have an additional load added to it, the strut will remain locked in the fully extended position.

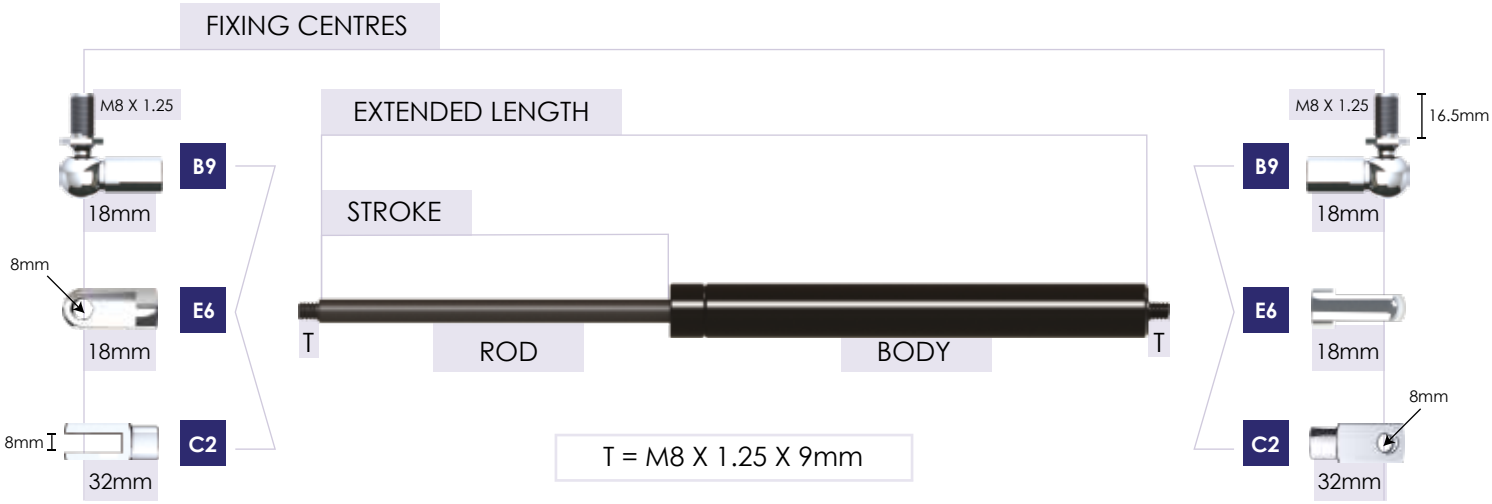
The mechanical lock in compression allows the user to set the strut up on an application which may require;

- a positive lock on a lid or flap in the closed position.
- the strut to open a lid or flap automatically from the closed lock position upon release of the mechanism.

Mechanical locking struts are available with a side release valve for adjusting in-situ.

Mechanical locking struts are available in stainless steel, however some components are diecast so offer limited corrosion resistance, and may not be suitable in marine or highly corrosive environments.

When ordering the stainless steel variant of the variable force mechanical locking strut, please remember to add 5mm to the body length.



Standard features:

Optional features:

CUSTOM STRUT ORDERING

CODE	ROD	BODY	STROKE RANGE	EXT. LENGTH CALCULATION	THREAD	FORCE INCREASE	FORCE RANGE
Steel **NS-FF-M-E** Stainless **NS-SS-FF-M-E**	10	21	10 - 500mm	stroke x 2 + 60	M8 x 1.25	39%	50 - 1200N

STANDARD RANGE SPECIFICATION (NS-FF-M-E)

PANEL WEIGHT FOR 10-21:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

STAINLESS STEEL VARIANT (NS-SS-FF-M-E)

COMPATIBLE RANGES	10-21
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Some components are diecast and can not be finished in stainless steel

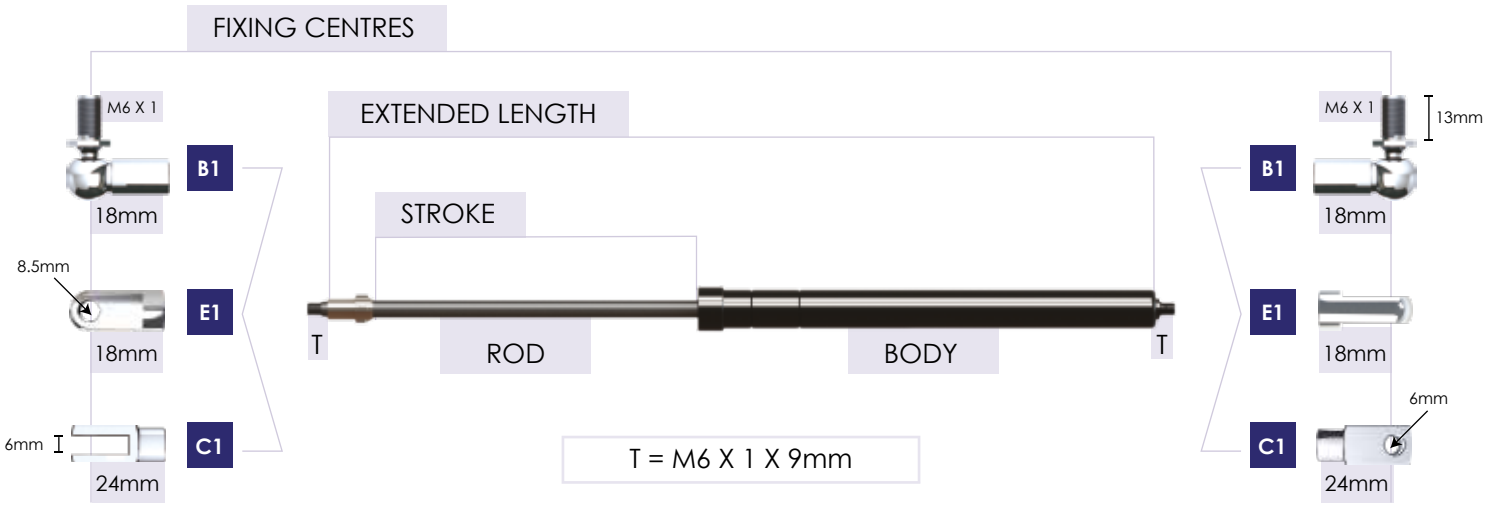
BRACKETS

See pages 58 - 66 for our full range

END FITTINGS

See pages 53 - 57 for our full range

	STEEL	PLASTIC (ON STRUTS OF UP TO 400N)	SS (STAINLESS STEEL)
BALL JOINTS	B9 - B12	PB5	SSB9 - SSB11
EYE ENDS	E6 - E10	-	SSE6 - SSE10
CLEVIS FORKS	C2	-	SSC2



Standard features:

EXAMPLE SHOWN: 8 - 19 VARIANT WITH M6 THREAD

Optional features:

CUSTOM STRUT ORDERING

CODE	ROD	BODY	STROKE RANGE	EXT. LENGTH CALCULATION	THREAD	FORCE INCREASE	FORCE RANGE
Steel **NS-FF-M-C**	8	19	10 - 500mm	stroke x 2 + 89	M6 x 1	33%	50 - 700N
Stainless **NS-SS-FF-M-C**	10	21	10 - 500mm	stroke x 2 + 108	M8 x 1.25	39%	50 - 1200N

STANDARD RANGE SPECIFICATION (NS-FF-M-C)

PANEL WEIGHT FOR 8-19:	6 - 35kg per pair
PANEL WEIGHT FOR 10-22:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

STAINLESS STEEL VARIANT (NS-SS-FF-M-C)

COMPATIBLE RANGES	8-19, 10-21
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Some components are diecast and can not be finished in stainless steel, as such these stainless steel struts are not recommended for marine applications.

BRACKETS See pages 58 - 66 for our full range

END FITTINGS See pages 53 - 57 for our full range

Standard features:

EXAMPLE SHOWN: 8 - 19 VARIANT WITH M6 THREAD

Optional features:

CUSTOM STRUT ORDERING

CODE	ROD	BODY	STROKE RANGE	EXT. LENGTH CALCULATION	THREAD	FORCE INCREASE	FORCE RANGE
Steel **NS-V-M-E**	8	19	10 - 500mm	stroke x 2 + 98.50	M6 x 1	33%	50 - 700N
Stainless **NS-SS-V-M-E**	10	21	10 - 500mm	stroke x 2 + 117.50	M8 x 1.25	39%	50 - 1200N

STANDARD RANGE SPECIFICATION (NS-V-M-E)

PANEL WEIGHT FOR 8-19:	6 - 35kg per pair
PANEL WEIGHT FOR 10-22:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

STAINLESS STEEL VARIANT (NS-SS-V-M-E)

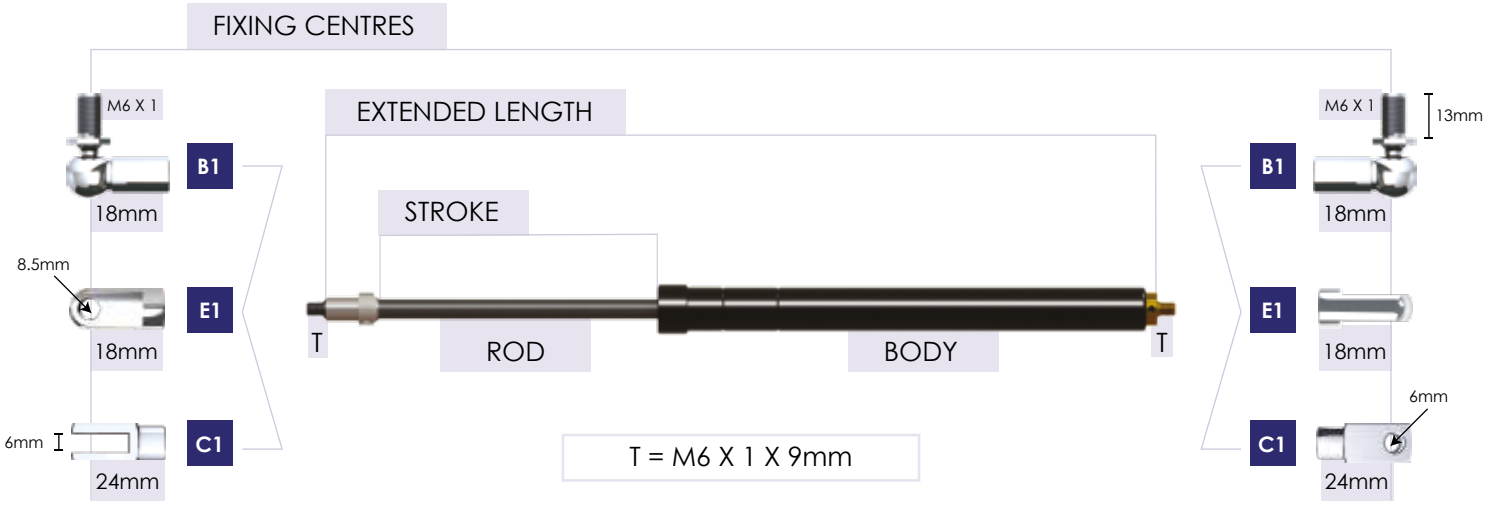
COMPATIBLE RANGES	8-19, 10-21
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

Some components are diecast and can not be finished in stainless steel, as such these stainless steel struts are not recommended for marine applications.

BRACKETS See pages 58 - 66 for our full range

END FITTINGS See pages 53 - 57 for our full range



Standard features:

EXAMPLE SHOWN: 8 - 19 VARIANT WITH M6 THREAD

Optional features:

CUSTOM STRUT ORDERING

CODE	ROD	BODY	STROKE RANGE	EXT. LENGTH CALCULATION	THREAD	FORCE INCREASE	FORCE RANGE
Steel **NS-V-M-C**	8	19	10 - 500mm	stroke x 2 + 107.50	M6 x 1	33%	50 - 700N
Stainless **NS-SS-V-M-C**	10	21	10 - 500mm	stroke x 2 + 127.50	M8 x 1.25	39%	50 - 1200N

STANDARD RANGE SPECIFICATION (NS-V-M-C)

PANEL WEIGHT FOR 8-19:	6 - 35kg per pair
PANEL WEIGHT FOR 10-22:	25 - 140kg per pair
WORKING TEMPERATURE RANGE:	-30°c to +80°c
MATERIAL:	STEEL
ROD:	QPQ
BODY COATING:	POWDER COATING
GUARANTEE:	2 years

STAINLESS STEEL VARIANT (NS-SS-V-M-C)

COMPATIBLE RANGES	8-19, 10-21
ROD:	CHROME PLATED 316
BODY:	316 SS (STAINLESS STEEL)

Please add 5mm to the body length for the stainless steel variant

Some components are diecast and can not be finished in stainless steel, as such these stainless steel struts are not recommended for marine applications.

BRACKETS See pages 58 - 66 for our full range

END FITTINGS See pages 53 - 57 for our full range

PRO-LINE
PROTECTION FOR GAS STRUTS

ENGINEERED TO PERFORM IN THE MOST DEMANDING ENVIRONMENTS.

The Metrol Pro-Line range combines technology used in our industrial Nitro-Springs with Nitro-struts, to create a range of gas struts that are designed for maximum durability in demanding environments.

Equip your application with market leading Pro-Line struts. They utilise high quality polyurethane sealing components and durable guiding elements to ensure longevity. In addition to this, they use technology to protect vital components from harsh environments.

POLYURETHANE SEALS AND WIPERS

Polyurethane sealing components and wipers that can provide high cycle rates and increased life expectancy over standard gas struts.

ALSO AVAILABLE AS STAINLESS STEEL AND VARIABLE

Gas struts manufactured from stainless steel 316 offer the greatest protection against rust and other forms of corrosion and degradation.

As a variable gas strut they can also be recharged to provide even greater longevity.

When ordering the stainless steel variant of the variable force Pro-Line strut, please remember to add 5mm to the body length.

PROTECTION TUBES WITH SEALING ELEMENTS

Protecting the piston from not only physical trauma but also helping to prevent dust and dirt ingress.

Standard features:

Optional features:

316

Also available with:

316

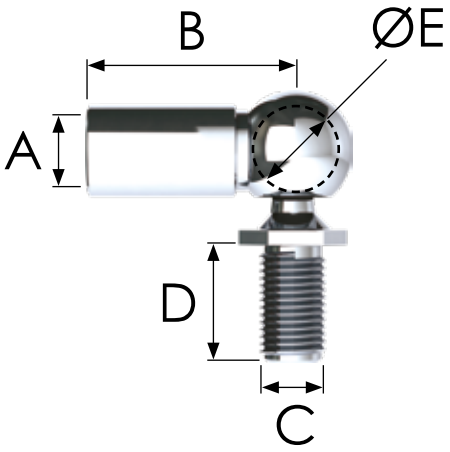
END FITTINGS

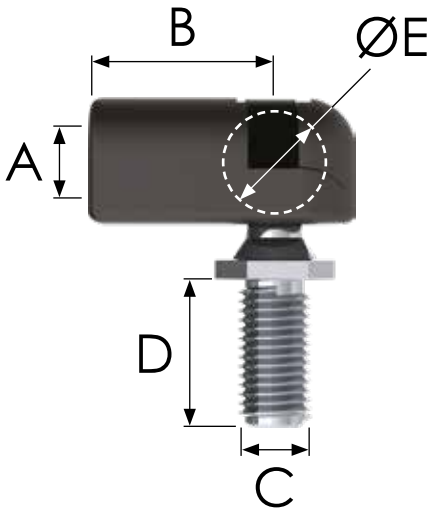
A wide range of end fittings are available to attach our gas struts to your application.

Mild steel end fittings have a bright zinc finish (others available on special request).

Stainless steel end fittings are available in 304 and 316.

Plastic end fittings are supplied with a black finish.





Also available in:

316

Images for illustration only.

STEEL BALL JOINTS

CODE	SS CODE	A	B	C	D	E	STRUT ROD DIA
B0	-	M6	22	M5	13	8	**6 & 8mm**
B1	**SSB1**	M6	18	M6	13	10	**6 & 8mm**
B2	-	M6	20	M6	13	10	**6 & 8mm**
B3	**SSB3**	M6	25	M6	13	10	**6 & 8mm**
B4	-	M6	30	M6	13	10	**6 & 8mm**
B5	**SSB5**	M6	18	M8	13	10	**6 & 8mm**
B5-10S	-	M8	18	M8	13	10	**10mm**
B6	**SSB6**	M6	20	M8	13	10	**6 & 8mm**
B7	**SSB7**	M6	25	M8	13	10	**6 & 8mm**
B7-10S	-	M8	25	M8	13	10	**10mm**
B8	-	M6	30	M8	13	10	**6 & 8mm**
B9	**SSB9**	M8	18	M8	16.5	13	**10mm**
B10	**SSB10**	M8	20	M8	16.5	13	**10mm**
B11	**SSB11**	M8	25	M8	16.5	13	**10mm**
B12	-	M8	30	M8	16.5	13	**10mm**
B13	-	M10	25	M10	20	16	**14mm**
B13-A	-	M10	25	M8	14	13	**14mm**
B14	-	M10	30	M10	20	16	**14mm**
B14-A	-	M10	30	M8	14	13	**14mm**
B15	**SSB15**	M10	35	M10	20	16	**14mm**
B15-A	-	M10	35	M8	14	13	**14mm**
B16	-	M14	45	M14	28	20	**20mm**

PLASTIC BALL JOINTS

CODE	SS CODE	A	B	C	D	E	STRUT ROD DIA
PB1	-	M6	18	M6	13	10	**6 & 8mm**
PB2	-	M6	25	M6	13	10	**6 & 8mm**
PB3	-	M6	18	M8	13	10	**6 & 8mm**
PB4	-	M6	25	M8	13	10	**6 & 8mm**
PB5	-	M8	18	M8	13	10	**10mm**

Strut force should be less than 400N

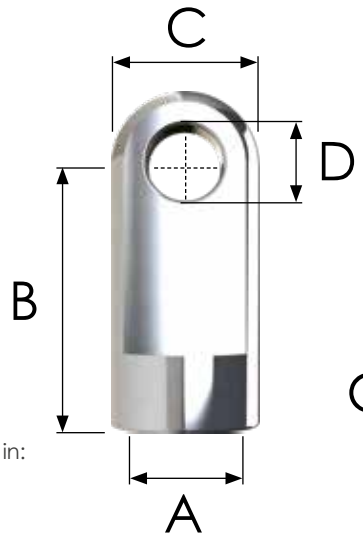
KEY

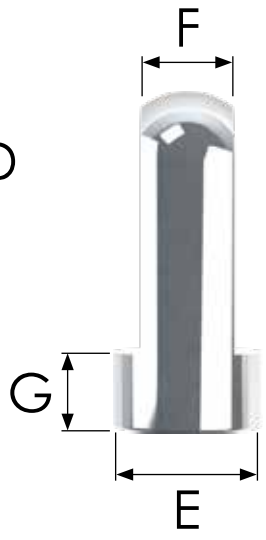
LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the socket to the end of the fitting
C	STUD THREAD	Where the end fitting attaches to the application
D	STUD LENGTH	Length of the thread that attaches to the application
E	BALL DIAMETER	Diameter of the spherical ball attached to the stud

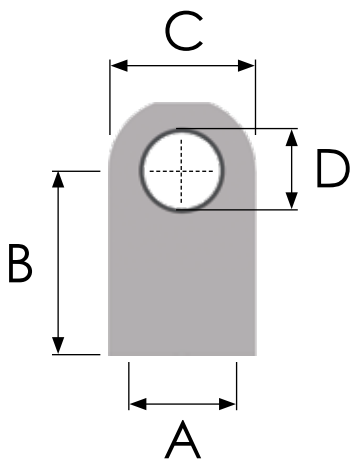
ADVICE ON USING END FITTINGS

- Where possible use ball joints to avoid side loading
- Ensure end fittings are fully screwed to the strut
- Ensure end fittings are in line to avoid side loading
- When using ball joints ensure the stud is fixed to the socket and the clip is in position
- Ensure the gas strut matches the chosen end fittings

BRACKETS See pages 58 - 66 for our full range







Also available in:

316

STEEL EYE ENDS

CODE	SS CODE	A	B	C	D	E	F	G	STRUT ROD DIA
E0	-	M6	17	13	6	9	2.8	10	6 & 8mm
E1	SSE1	M6	18	15	8.5	12	4.8	11	6 & 8mm
E2	SSE2	M6	20	15	8.5	11	4.8	12	6 & 8mm
E3	SSE3	M6	22	15	8.5	9	4.8	12	6 & 8mm
E4	SSE4	M6	25	15	8.5	11	4.8	12	6 & 8mm
E5	SSE5	M6	30	15	8.5	12	4.8	16	6 & 8mm
E6	SSE6	M8	18	18	8	18	9.8	6	10mm
E7	-	M8	20	14	8	14	9.8	7	10mm
E8	-	M8	22	14	8	14	9.8	10	10mm
E9	SSE9	M8	25	18	8.5	18	9.8	5	10mm
E10	SSE10	M8	30	18	8	18	9.8	14	10mm
-	SSE10-A	M8	30	18	12	18	9.8	14	10mm
E11	-	M10	22	20	10	20	11.8	10	14mm
E12	-	M10	30	20	10	20	11.8	14	14mm
E13	SSE13	M10	35	20	10	20	11.8	16	14mm
E14	-	M14	40	25	14	25	13.8	20	20mm
-	SSE15-A	M10	25	20	12	20	11.8	10	14mm

SHOULDERLESS STEEL EYE ENDS

CODE	SS CODE	A	B	C	D	F	STRUT ROD DIA
CE2	-	M6	16	16	8.25	8	6 & 8mm
CE5	-	M6	20	16	8.25	7.8	6 & 8mm

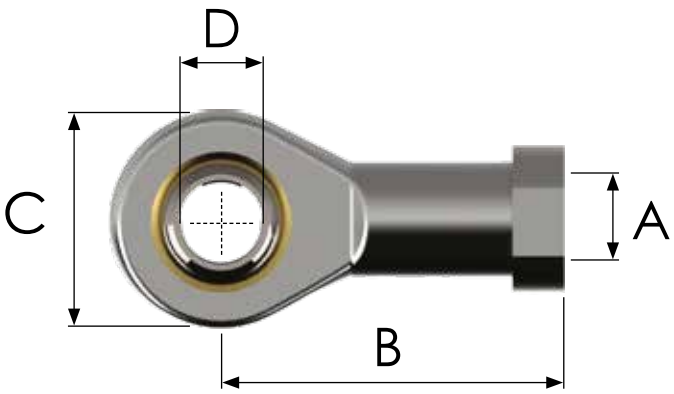
KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the eye to the end of the fitting
C	OUTER RADIUS	Outer eye radius
D	EYE HOLE DIAMETER	The measurement of the internal diameter of the eye
E	SHOULDER WIDTH	Width of the shoulder
F	THICKNESS	Eye thickness
G	SHOULDER HEIGHT	Height of the shoulder

ADVICE ON USING END FITTINGS

- Where possible use ball joints to avoid side loading
- Ensure end fittings are fully screwed to the strut
- Ensure end fittings are in line to avoid side loading
- When using ball joints ensure the stud is fixed to the socket and the clip is in position
- Ensure the gas strut matches the chosen end fittings

BRACKETS See pages 58 - 66 for our full range



Also available in:

316

STEEL ROSE EYES

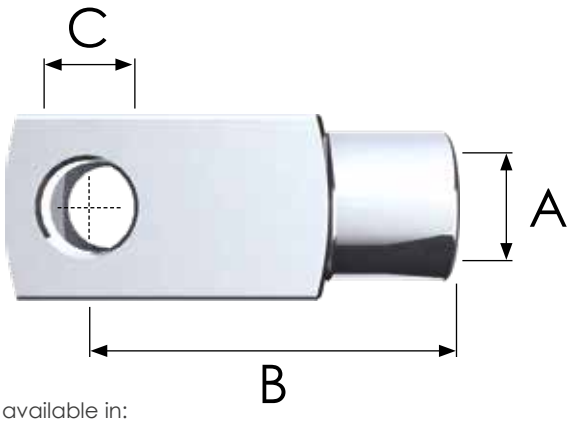
CODE	SS CODE	A	B	C	D	E	F	G	H	STRUT ROD DIA
RE8	**SSRE8**	M6	30	20	6	11	6.75	5	9	**6 & 8mm**
RE10	**SSRE10**	M8	36	24	8	14	9	5	12	**10mm**
RE12	**SSRE12**	M10	43	28	10	17	10.5	6.5	14	**14mm**

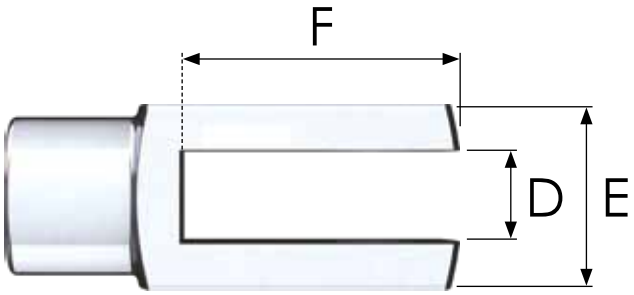
KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the eye to the end of the fitting
C	OUTER RADIUS	Outer eye radius
D	EYE HOLE DIAMETER	The measurement of the internal diameter of the eye
E	SHOULDER WIDTH	Width of the shoulder
F	THICKNESS	Eye thickness
G	SHOULDER HEIGHT	Height of the shoulder
H	SPHERE PROFILE	Width of the sphere profile

ADVICE ON USING END FITTINGS

- Where possible use ball joints to avoid side loading
- Ensure end fittings are fully screwed to the strut
- Ensure end fittings are in line to avoid side loading
- When using ball joints ensure the stud is fixed to the socket and the clip is in position
- Ensure the gas strut matches the chosen end fittings





Also available in:

316

STEEL CLEVIS FORKS

CODE	SS CODE	A	B	C	D	E	F	STRUT ROD DIA
C1	SSC1	M6	24	6	6	12	19	6 & 8mm
C2	SSC2	M8	32	8	8	16	25	10mm
C3	SSC3	M10	40	10	10	20	32	14mm
C4	-	M14	56	14	14	27	44	20mm

KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the eye to the end of the fitting
C	EYE HOLE DIAMETER	The measurement of the internal diameter of the eye
D	GAP WIDTH	Width of the fork gap
E	EXTERNAL WIDTH	External width of the fork
F	FORK DEPTH	Depth of the fork

ADVICE ON USING END FITTINGS

- Where possible use ball joints to avoid side loading
- Ensure end fittings are fully screwed to the strut
- Ensure end fittings are in line to avoid side loading
- When using ball joints ensure the stud is fixed to the socket and the clip is in position
- Ensure the gas strut matches the chosen end fittings

BRACKETS See pages 58 - 66 for our full range

Also available in:

304 316

BRACKETS

A wide range of brackets are available to attach our gas struts to your application.

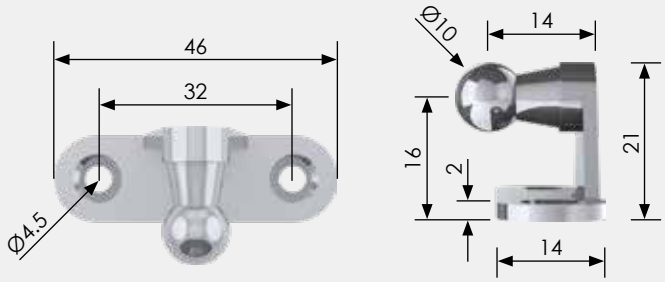
Mild steel brackets have a bright zinc finish (others available on special request).

Stainless steel brackets are available in 304 and 316.

CONTENTS

STEEL BRACKET TYPE 1

PRODUCT CODE: BRK-1



COMPATIBILITY

BALL JOINTS

B1 - B8

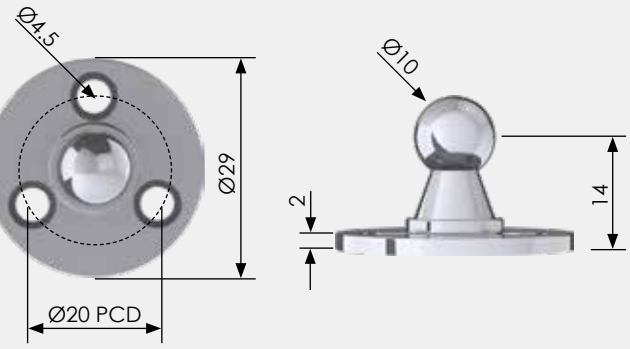
GAS STRUT ROD DIAMETER

6 & 8mm

316 SSBRK-1

STEEL BRACKET TYPE 2

PRODUCT CODE: BRK-2



COMPATIBILITY

BALL JOINTS

B1 - B8

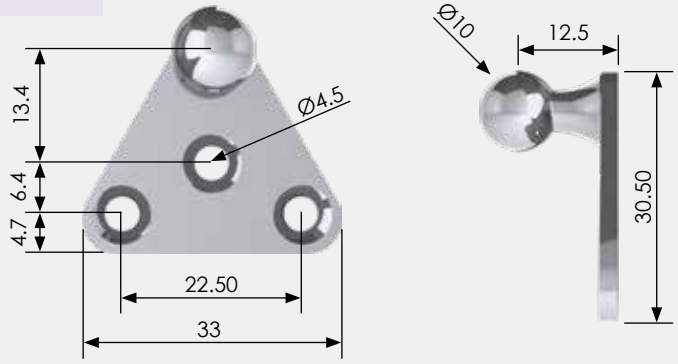
GAS STRUT ROD DIAMETER

6 & 8mm

316 SSBRK-2

STEEL BRACKET TYPE 3

PRODUCT CODE: BRK-3



COMPATIBILITY

BALL JOINTS

B1 - B8

GAS STRUT ROD DIAMETER

6 & 8mm

304 SSBRK-3

STEEL BRACKET TYPE 4

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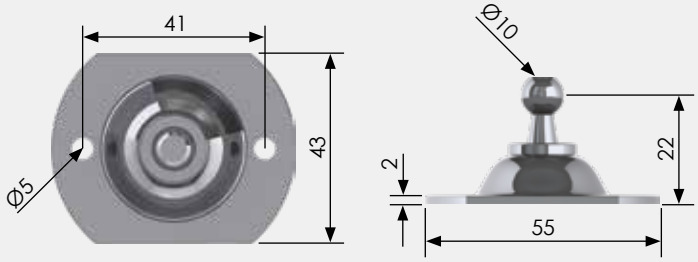


COMPATIBILITY

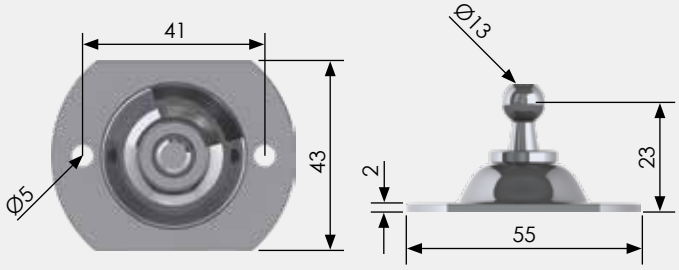
BALL JOINTS
B1 - B8

GAS STRUT ROD DIAMETER
6 & 8mm

304 SSBRK-4

STEEL BRACKET TYPE 4A

PRODUCT CODE: BRK-4A



COMPATIBILITY

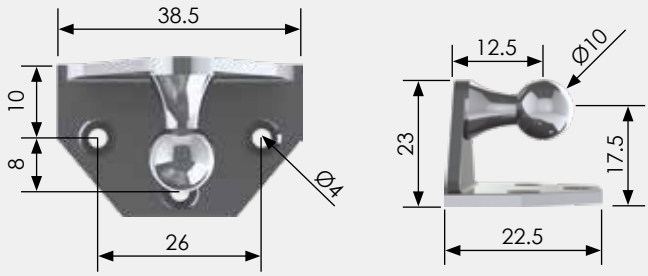
BALL JOINTS
B9 - B12

GAS STRUT ROD DIAMETER
8, 10 & 14mm

304 SSBRK-4A

STEEL BRACKET TYPE 5

PRODUCT CODE: BRK-5



COMPATIBILITY

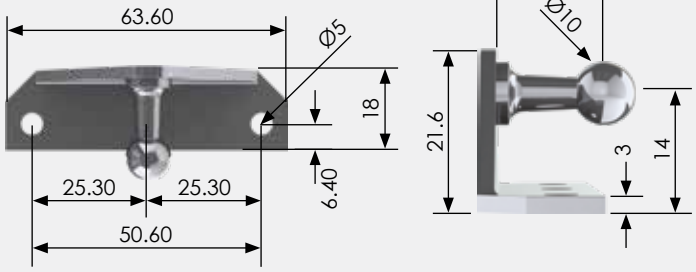
BALL JOINTS
B1 - B8

GAS STRUT ROD DIAMETER
6 & 8mm

304 SSBRK-5

STEEL BRACKET TYPE 052L

PRODUCT CODE: BRK-052L



COMPATIBILITY

BALL JOINTS

B1 - B8

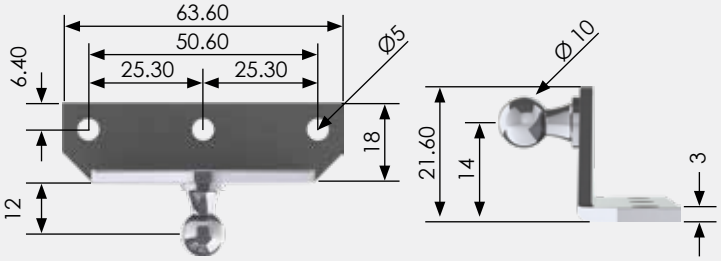
GAS STRUT ROD DIAMETER

6 & 8mm

316 SSBRK-052L

STEEL BRACKET TYPE 052R

PRODUCT CODE: BRK-052R



COMPATIBILITY

BALL JOINTS

B1 - B8

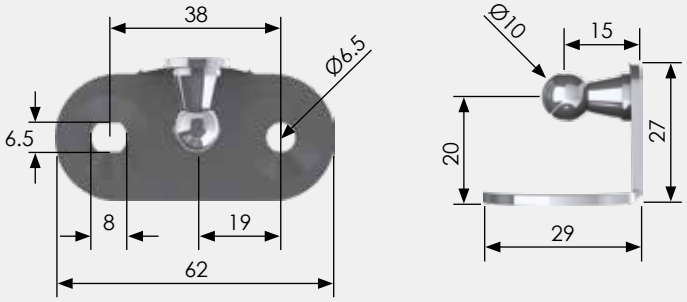
GAS STRUT ROD DIAMETER

6 & 8mm

316 SSBRK-052R

STEEL BRACKET TYPE 6

PRODUCT CODE: BRK-6



COMPATIBILITY

BALL JOINTS

B1 - B8

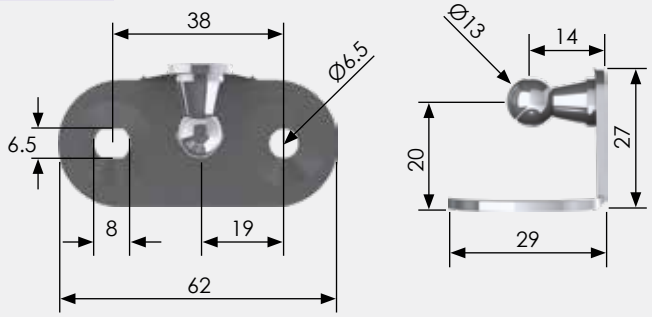
GAS STRUT ROD DIAMETER

6 & 8mm

304 SSBRK-6

STEEL BRACKET TYPE 6A

PRODUCT CODE: BRK-6A



COMPATIBILITY

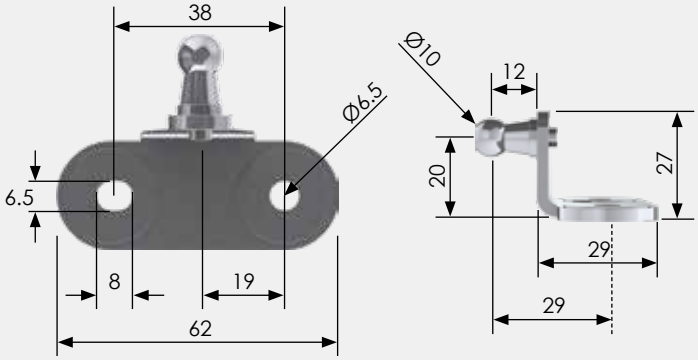
BALL JOINTS
B9 - B12

GAS STRUT ROD DIAMETER
8 & 10mm

304 SSBRK-6A

STEEL BRACKET TYPE 6R

PRODUCT CODE: BRK-6R



COMPATIBILITY

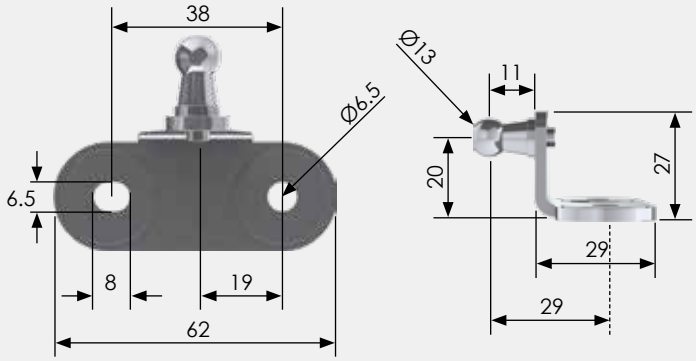
BALL JOINTS
B1 - B8

GAS STRUT ROD DIAMETER
6 & 8mm

STAINLESS STEEL UNAVAILABLE

STEEL BRACKET TYPE 6RA

PRODUCT CODE: BRK-6RA



COMPATIBILITY

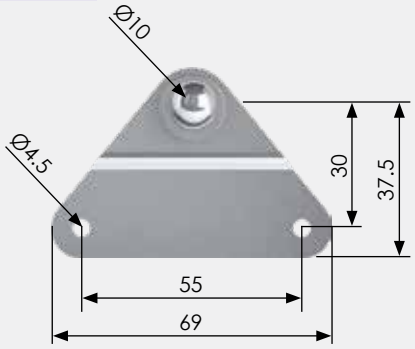
BALL JOINTS
B9 - B12

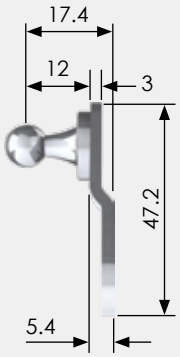
GAS STRUT ROD DIAMETER
8 & 10mm

STAINLESS STEEL UNAVAILABLE

STEEL BRACKET TYPE 7

PRODUCT CODE: BRK-7





COMPATIBILITY

BALL JOINTS

B1 - B8

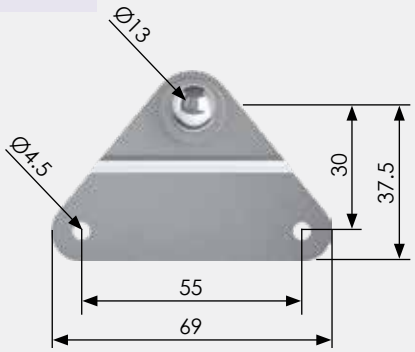
GAS STRUT ROD DIAMETER

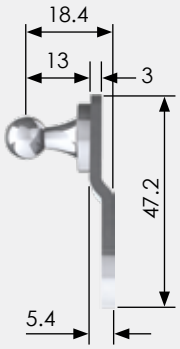
6 & 8mm

304 SSBRK-7

STEEL BRACKET TYPE 7A

PRODUCT CODE: BRK-7A





COMPATIBILITY

BALL JOINTS

B9 - B12

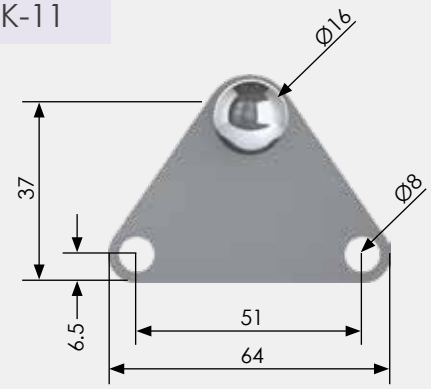
GAS STRUT ROD DIAMETER

8, 10 & 14mm

304 SSBRK-7A

STEEL BRACKET TYPE 11

PRODUCT CODE: BRK-11



COMPATIBILITY

BALL JOINTS

B13 - B15

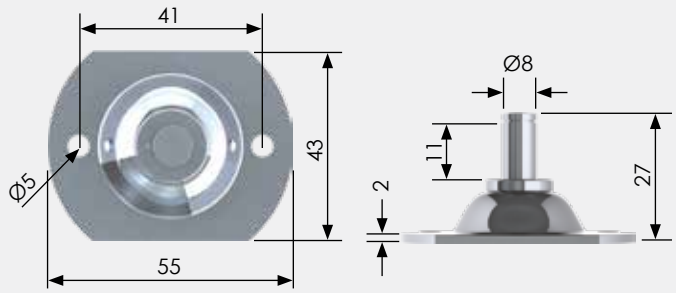
GAS STRUT ROD DIAMETER

10 & 14mm

STAINLESS STEEL UNAVAILABLE

STEEL BRACKET TYPE 4B

PRODUCT CODE: BRK-4B



Note: Supplied with retaining clip.

COMPATIBILITY

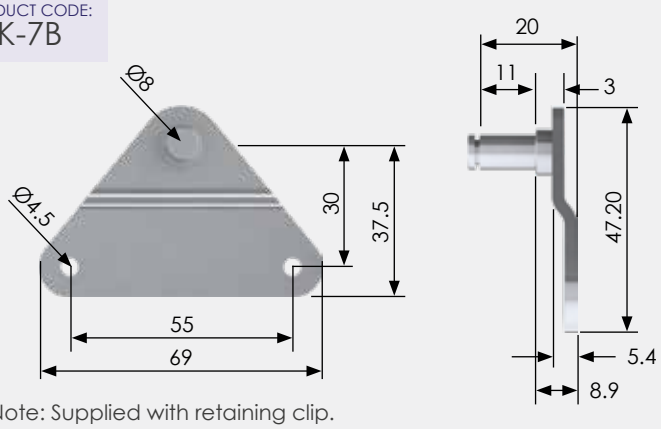
EYE ENDS
E1 - E13

GAS STRUT ROD DIAMETER
6, 8 & 10mm

316 SSBRK-4B

STEEL BRACKET TYPE 7B

PRODUCT CODE: BRK-7B



Note: Supplied with retaining clip.

COMPATIBILITY

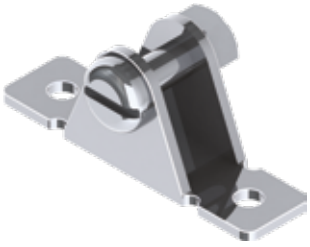
EYE ENDS
E1 - E13

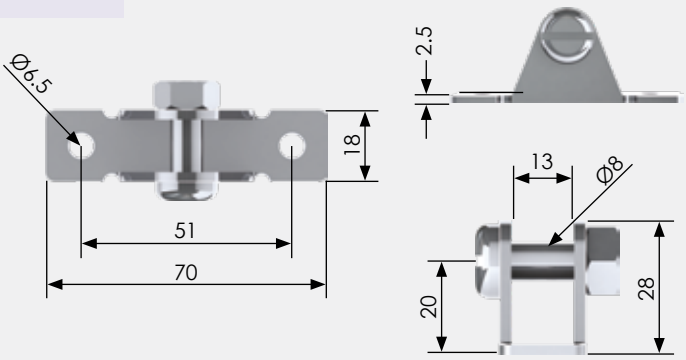
GAS STRUT ROD DIAMETER
6, 8 & 10mm

316 SSBRK-7B

STEEL BRACKET TYPE 08-90

PRODUCT CODE: BRK-08-90





COMPATIBILITY

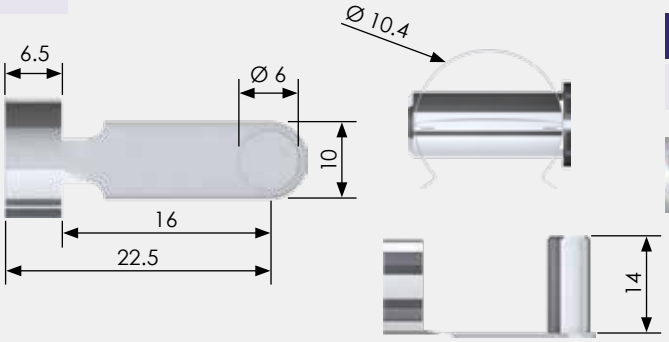
EYE ENDS
E1 - E13

GAS STRUT ROD DIAMETER
6, 8, 10 & 14mm

316 SSBRK-08-90

STEEL CLIP TYPE **C1**

PRODUCT CODE: C1-CLIP

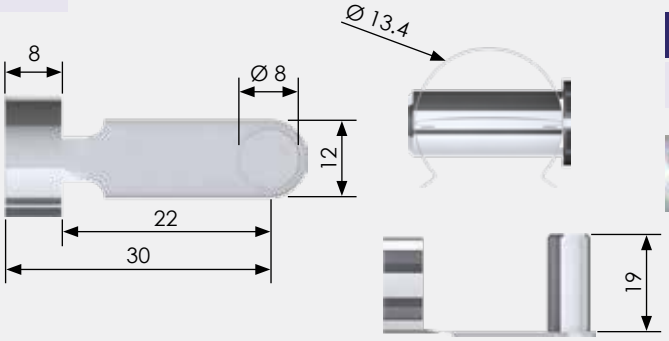


COMPATIBILITY

CLEVIS FORKS
C1
✗ STAINLESS STEEL UNAVAILABLE

STEEL CLIP TYPE **C2**

PRODUCT CODE: C2-CLIP



COMPATIBILITY

CLEVIS FORKS
C2
✗ STAINLESS STEEL UNAVAILABLE

STEEL CLIP TYPE **C3**

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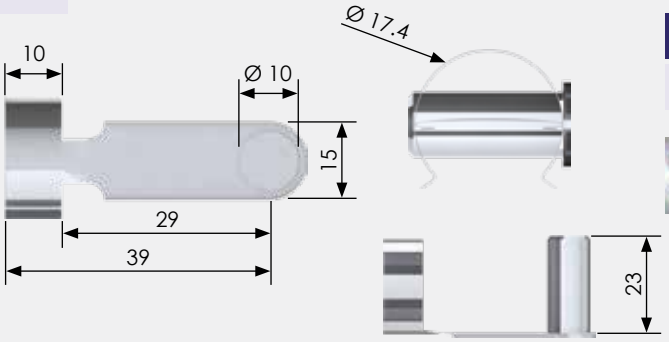


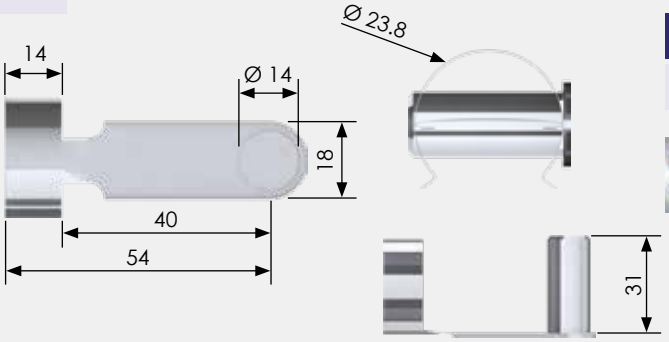
COMPATIBILITY

CLEVIS FORKS
C3
✗ STAINLESS STEEL UNAVAILABLE

METROL

STEEL CLIP
TYPE **C4**

PRODUCT CODE:
C4-CLIP



COMPATIBILITY

CLEVIS FORKS
C4

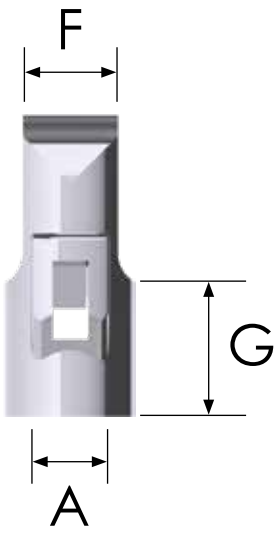
STAINLESS STEEL UNAVAILABLE

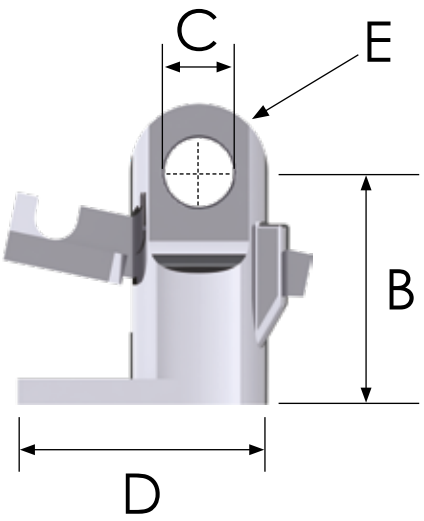
LOCKING STRUT RELEASE MECHANISMS

A variety of release mechanisms are available for the operation of locking gas struts, this section displays the more popular types but a larger range is available upon request.

Direct acting lever mechanisms attach to the rod of the strut. Moving the lever unlocks the strut and allows movement.

Remote acting systems use a release head attached to the rod of the strut and a Bowden cable connected to a remote lever or button. This type of mechanism is ideal if the strut is not easily accessible.





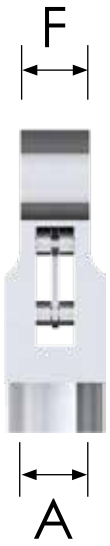
PIN RELEASE HEAD

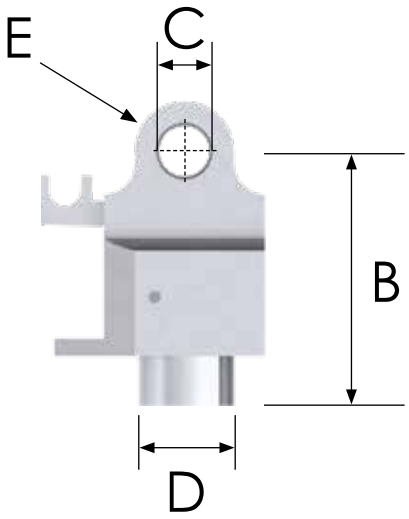
REFERENCE	A	B	C	D	E	F	G	STRUT SIZE
PRH01-1	M8x1	27	8	29	16	11	15	**8-21 & 8-27**
PRH01-2	M10x1	27	8	29	16	11	15	**10-21 & 10-27**

KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the socket to the end of the fitting
C	EYE DIAMETER	The measurement of the internal diameter of the eye
D	SHOULDER WIDTH	Diameter of the shoulder
E	OUTER RADIUS	Outer eye radius
F	THICKNESS	Eye thickness
G	SHOULDER HEIGHT	Height of the shoulder

Other styles of pin release systems available upon request.





PIN RELEASE HEAD

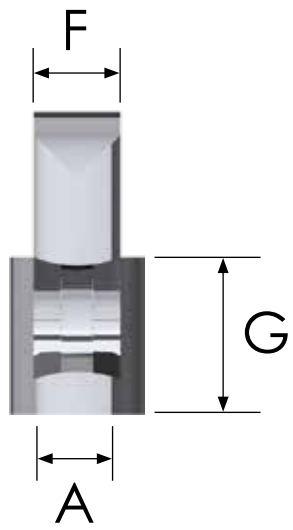
REFERENCE	A	B	C	D	E	F	STRUT SIZE
PRH02-1	M10x1	41	8	16	16	11	**10-21 & 10-27**

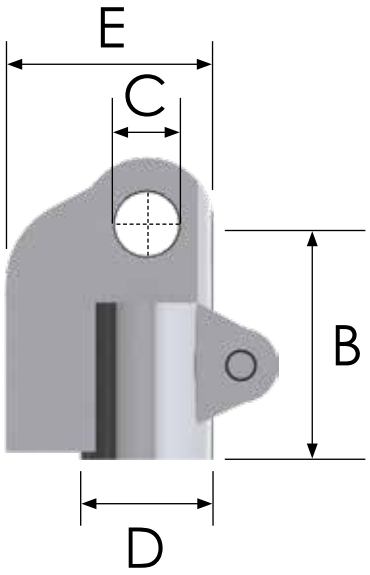
KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the socket to the end of the fitting
C	EYE DIAMETER	The measurement of the internal diameter of the eye
D	SHOULDER WIDTH	Diameter of the shoulder
E	OUTER RADIUS	Outer eye radius
F	THICKNESS	Eye thickness

Other styles of pin release systems available upon request.

PRH03 RELEASE HEADS
PIN LOCKING END FITTINGS
STANDARD STEEL





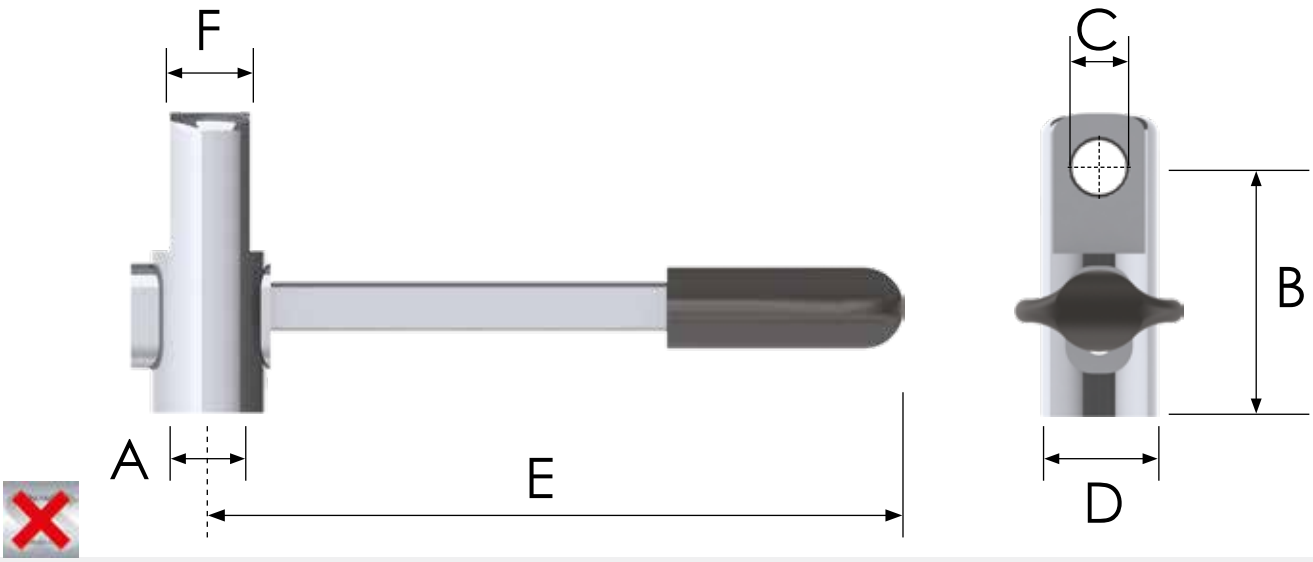
PIN RELEASE HEAD

REFERENCE	A	B	C	D	E	F	G	STRUT SIZE
PRH03-1	M10x1	30	8	17	26.5	11	20	**10-21 & 10-27**
PRH03-2	M10x1	30	10	17	26.5	11	20	**10-21 & 10-27**
PRH03-3	M10x1	39	12	21	40	14	26	**10-21 & 10-27**

KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the socket to the end of the fitting
C	EYE DIAMETER	The measurement of the internal diameter of the eye
D	SHOULDER WIDTH	Diameter of the shoulder
E	OUTER RADIUS	Outer eye radius
F	THICKNESS	Eye thickness
G	SHOULDER HEIGHT	Height of the shoulder

Other styles of pin release systems available upon request.



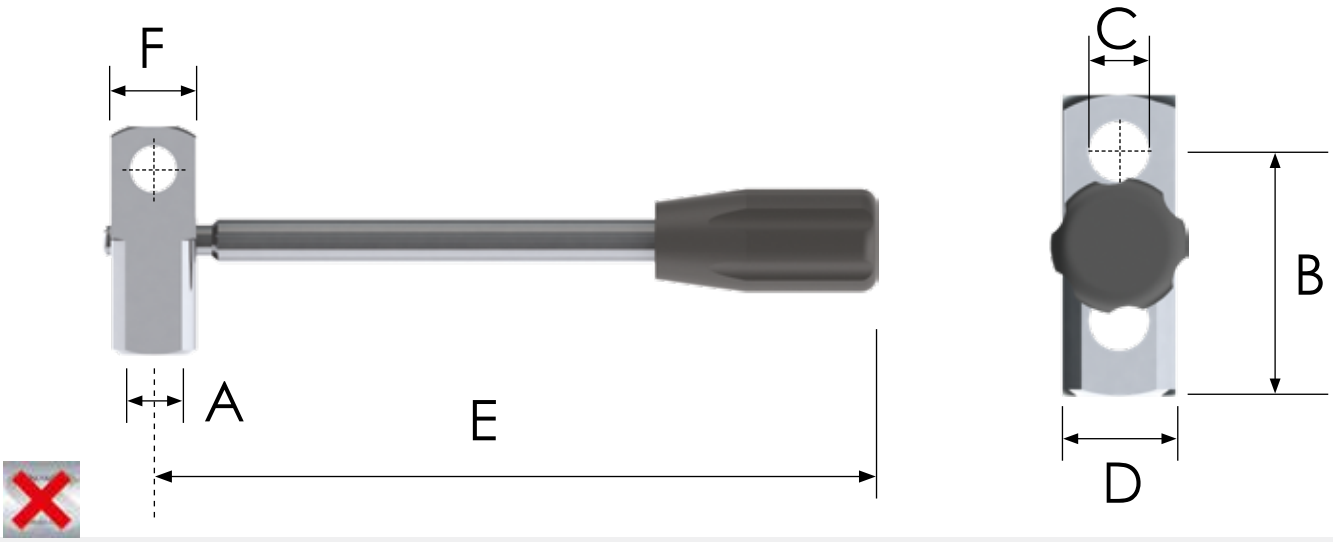
PIN RELEASE HEAD WITH HANDLE

REFERENCE	A	B	C	D	E	F	STRUT SIZE
PRH04-1	M8x1	37	8	18	104	12	**8-21 & 8-27**
PRH04-2	M10x1	37	8	18	104	12	**10-21 & 10-27**

KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the socket to the end of the fitting
C	EYE DIAMETER	The measurement of the internal diameter of the eye
D	SHOULDER WIDTH	Diameter of the shoulder
E	LEVER LENGTH	Length from the centre of the eye to the end of the lever
F	THICKNESS	Eye thickness

Other styles of pin release systems available upon request.

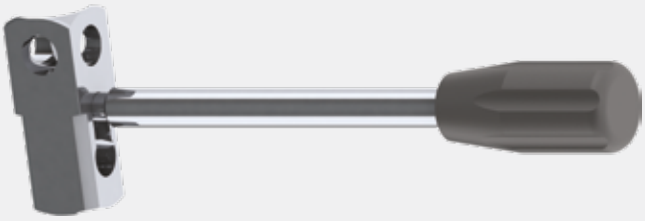


PIN RELEASE HEAD WITH HANDLE

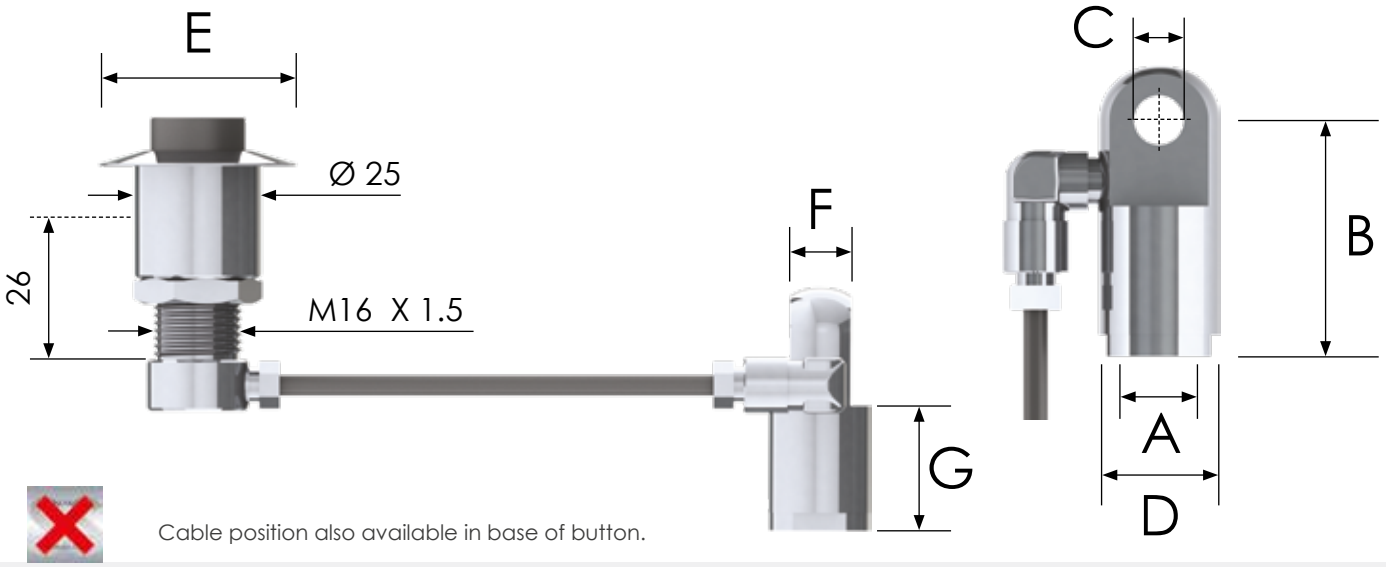
REFERENCE	A	B	C	D	E	F	STRUT SIZE
PRH05-1	M10x1	32.5	8	15	127	15	**10-21 & 10-27**
PRH05-2	M10x1	37	8	18	91	12	**10-21 & 10-27**

KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the socket to the end of the fitting
C	EYE DIAMETER	The measurement of the internal diameter of the eye
D	SHOULDER WIDTH	Diameter of the shoulder
E	LEVER LENGTH	Length from the centre of the eye to the end of the lever
F	THICKNESS	Eye thickness



Other styles of pin release systems available upon request.



Cable position also available in base of button.

PIN RELEASE HEAD

REFERENCE	A	B	C	D	E	F	G	STRUT SIZE
PRH06-1	M10x1	38.5	8	20	39	12	25	**10-21 & 10-27**
PRH06-2	M8x1	38.5	8	20	39	12	25	**8-21 & 8-27**

STANDARD CABLE LENGTHS

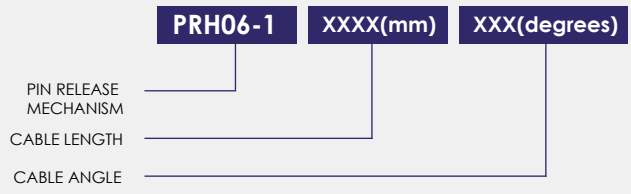
150 300 500 750 1000 1500 2000

Custom made cable lengths available upon request.

KEY

LABEL	PART	DESCRIPTION
A	INTERNAL THREAD	Where the end fitting screws onto the strut
B	FITTING LENGTH	From the centre of the socket to the end of the fitting
C	EYE DIAMETER	The measurement of the internal diameter of the eye
D	SHOULDER DIAMETER	Diameter of the shoulder
E	FASCIA RADIUS	Fascia radius
F	THICKNESS	Eye thickness
G	SHOULDER HEIGHT	Height of the shoulder

HOW TO ORDER



Other styles of pin release systems available upon request.

RUBBER COVERS
FOR PIN RELEASE HEADS

A range of pin release head rubber covers are available to add extra protection.

These rubber covers prevent dust and dirt from clogging up the mechanism of the pin release system and therefore extend the life of the assembled gas strut.

Metrol has a full range of activators available on request.

Please call for more information.

BOWDEN OR HYDRAULIC CABLES
CUSTOM MADE LENGTHS AVAILABLE

Bowden and hydraulic cables enable remote use of a pin locking strut via a pin release system, see below for our standard lengths (in mm). Please get in touch for custom made lengths.

150	**300**	**500**	**750**	**1000**	**1500**	**2000**

Also available in:

316

SAFETY LOCKING TUBES

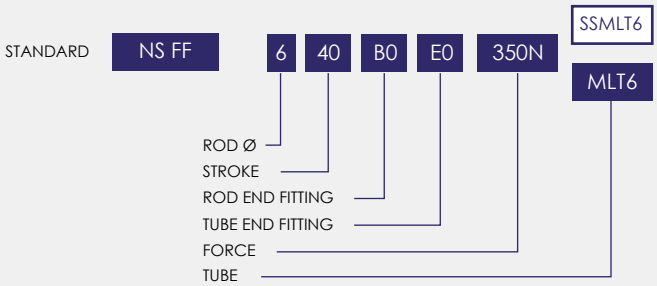
Locking tubes automatically lock in the fully extended position. The locking tube can be used as a safety device on applications such as lids or hatches where people may be underneath them. In the event of sudden loss of gas pressure the strut will remain locked and fully extended.

It is advisable for ease of closing that only one of a pair of struts has a locking tube on each application.

Locking tubes are easy to fit and can also be retrofit to an existing application.

Available in stainless steel 316.

HOW TO ORDER WITH A GAS STRUT



Please note: There is a 10mm reduction in the stroke of the gas strut if a safely locking tube is fitted.

316

SAFETY LOCKING TUBES

TUBE REFERENCE		STRUT SIZE	TUBE DIAMETER
MLT 6	SSMLT 6	6 - 15	22
MLT 8	SSMLT 8	8 - 18	25
MLT 10	SSMLT 10	10 - 21	28
MLT 14	SSMLT 14	14 - 27	32

Custom sizes available on request

STAINLESS STEEL VARIANT (SSMLT)

MATERIAL:	316 SS (STAINLESS STEEL)

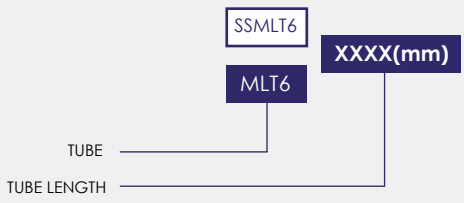
Please note: The locking mechanism is diecast and is not available in stainless steel.

FEATURES

Nitro-Struts safety locking tubes are designed to be simple to use and prevent injury to the operator in the unlikely event of a loss of gas pressure in the strut.

- The unit positively locks on full extension of the gas strut.
- Simple to use, locks automatically on extension and is released by pushing the safety tube at the correct point to allow the strut to compress.
- Single locking gas strut can be used in conjunction with a standard Nitro-Strut on an application.
- No need for separate safety locking mechanisms, keeping the unit neat and easy to use.
- Ensure peace of mind when working under a heavy object.

HOW TO ORDER CUSTOM LENGTHS



Also available in:

316

PROTECTION TUBES

Protection tubes sit over the piston rod and protect against dents and scratches to the piston surface, which can result in damage to sealing components and lead to early failure.

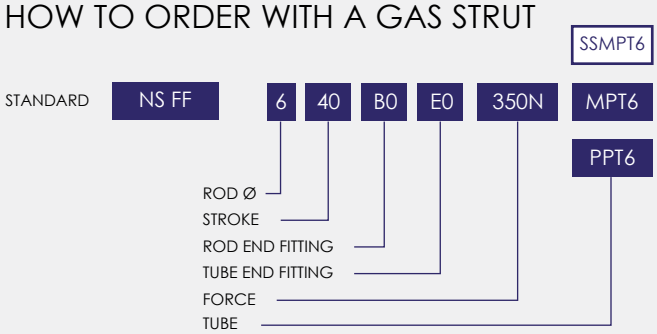
The protection tubes also come with a collar that reduces contamination reaching the rod that may ingress into the strut and cause early failure.

The nylon collar can also add additional stability to the strut, especially where lateral loads or vibrations are present.

Protection tubes can be retrofit to gas struts already in use.

Available in stainless steel 316.

HOW TO ORDER WITH A GAS STRUT



316

PROTECTION TUBES *(Plastic, Metal & Stainless Steel)*

TUBE REFERENCE			STRUT SIZE	TUBE DIAMETER
PPT 6	MPT 6	SSMPT 6	6 - 15	22
PPT 8	MPT 8	SSMPT 8	8 - 18	25
PPT 10	MPT 10	SSMPT 10	10 - 21	28
PPT 14	MPT 14	SSMPT 14	14 - 27	32

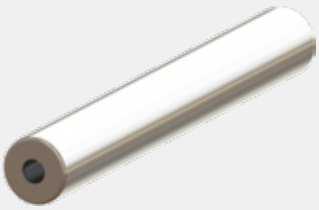
Custom sizes available on request

PLASTIC VARIANT (PPT)

MATERIAL:	MOBLEN PA66GF30 (PLASTIC)

STAINLESS STEEL VARIANT (SSMPT)

MATERIAL:	316 SS (STAINLESS STEEL)

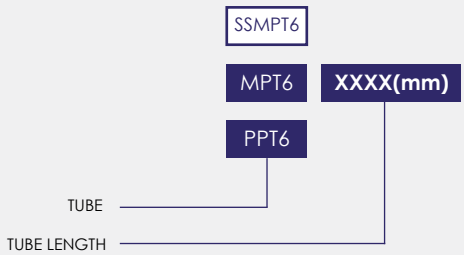


FEATURES

Protection tubes are fitted to gas struts when they are to be used in an environment where the gas strut piston can be damaged from scratches or dents, or where contamination of the piston rod can damage the seals.

- Available in plastic, metal and stainless steel.
- Suitable for use with NS-FF, NS-V and NS-SS Nitro-Struts.
- Protection tubes can prolong the life of the gas strut in dirty and dusty environments.

HOW TO ORDER CUSTOM LENGTHS



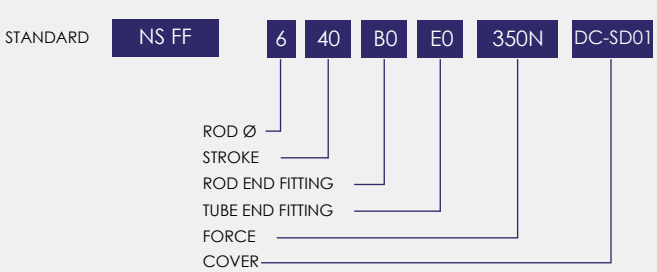
DUST COVERS

Dust covers protect against ingress of dust, dirt or oil into the strut which can damage sealing components and reduce the life of the product.

It is recommended that in environments where dirt, sand, abrasive dust or oil contaminants are present, that dust covers should be fitted to the struts.

Dust covers can be retrofit to gas struts already in use.

HOW TO ORDER WITH A GAS STRUT



DUST COVERS

COVER REFERENCE	STRUT SIZE	COVER DIAMETER
DC-SD01	6 - 15	15
DC-SD02	8 - 18	18
DC-SD03	10 - 21	21
DC-SD04	14 - 27	28
TRACTION STRUTS		
DC-TR2	8 - 22	22

FEATURES

In applications where abrasive dust and dirt particles can stick to the piston and be pulled into the gas strut during the compression stroke, fitting a dust cover can significantly increase the life expectancy of the gas strut.

These abrasive particles can wear and damage the seal, resulting in gas loss and early failure of the strut. Dust seals can also be retrofit to gas struts.

Contact
MR JOHN SMITH

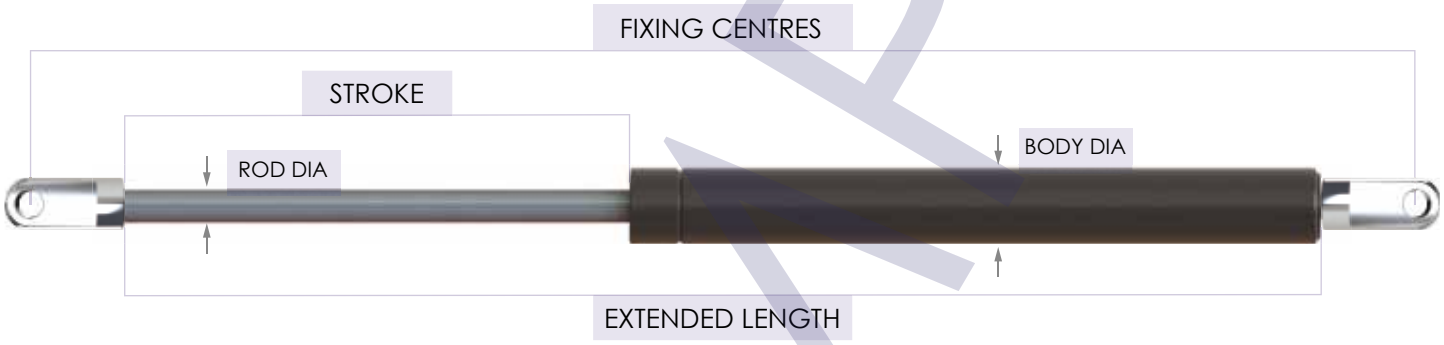
Telephone
01604 499 332

Company name
MR JOHN SMITH

Email
SALES@METROL.COM

Address
Metrol Springs Limited, 5 Clayfield Close, Moulton Park Industrial Estate, Northampton, NN3 6QF

Rod Dia mm	Tube Dia mm	Stroke mm	Fixing Centres mm	Extended Length mm	Force N	Valve Required?	Stainless Steel?	Quantity Required
8	18	80	265	205	700	NO	NO	12



ROD END

STRUT REFERENCE

BALL JOINT

- Metal ☐
- Plastic ☐
- Stainless Steel ☐

EYE END

- Metal ■
- Plastic ☐
- Stainless Steel ☐

CLEVIS FORK

- Metal ☐
- Stainless Steel ☐

NOTES

BODY END

STRUT REFERENCE

BALL JOINT

- Metal ☐
- Plastic ☐
- Stainless Steel ☐

EYE END

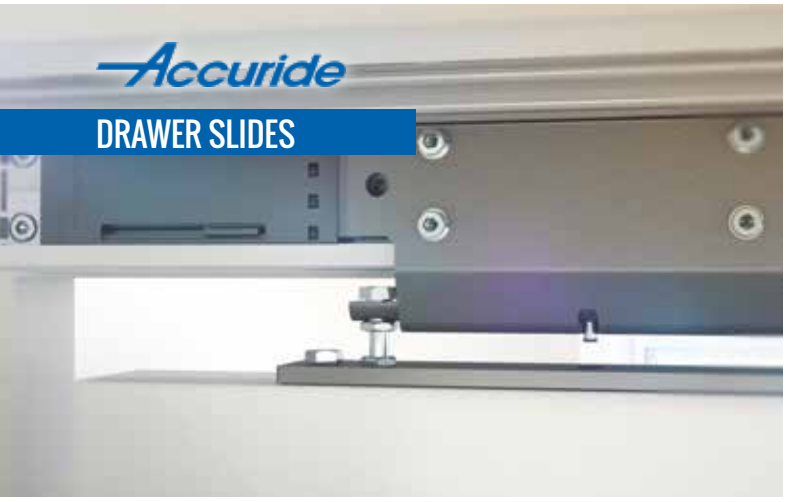
- Metal ■
- Plastic ☐
- Stainless Steel ☐

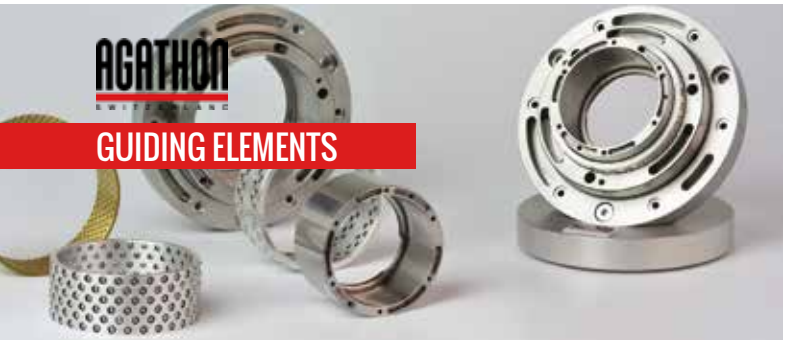
CLEVIS FORK

- Metal ☐
- Stainless Steel ☐

METROL

Metrol Springs Ltd specialises in the design and manufacture of **Gas Springs** and **Gas Struts**, offering technical support and stock market leading products including **Accuride Drawer Slides**, Quality **Hardware Components**, **Agathon Guiding Elements**, **TiMotion Linear Actuators** and **Porter Precision Punches**.





FOR MORE INFORMATION ON OUR PRODUCT RANGES **CONTACT US ON: 01604 499 332**

METROL

NitroStruts

METROL SPRINGS LIMITED

TEL: +44 (0) 1604 499 332
FAX: +44 (0) 1604 493 390
EMAIL: SALES@METROL.COM
WEB: WWW.METROL.COM

5 CLAYFIELD CLOSE
MOULTON PARK INDUSTRIAL ESTATE
NORTHAMPTON
NN3 6QF
UK