Gas Strut Catalogue

ALROSE PRODUCTS LTD
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ENGLAND
# CATALOGUE 2012

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ABOUT ALROSE PRODUCTS

We are situated on the borders of three counties with excellent working and living conditions and access to all parts of Europe.

In the mid-70s a new way of lifting and counterbalancing loads came into prominence. The Gas Spring or Gas Strut smoothly and economically performed in areas where coils, pulleys, ropes and large dangling weights previously strained and jerked. The company was involved from the outset in the development of these devices, which used compressed nitrogen which was persuaded to stay in place for some years.

In 1985 the company acquired the sales and marketing rights of “British Gas Springs” in Telford, as growth of product sales leaped and satisfied market demands for variations on the original “British Gas Springs”. Shortly afterwards our manufacturing facility was doubled in the UK to design and manufacture our own range of gas springs, dampers and hydraulic cylinders.

Quality Assurance rating by Lloyds was upgraded in 2008 to ISO 9001:2008, and is current to 2015.

Mission Statement
Our ongoing aim is for a product of durability and flair, made with care, coupled with excellent service and an understanding of customers’ needs. We are small enough to be really flexible but big enough to produce large production runs.

We accept most major credit and debit cards – MASTERCARD, VISA, MAESTRO.
CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

Alrose Products Ltd
Incorporating British Gas Springs
3-4 King Street, Langtoft, Peterborough,
Cambridgeshire, PE6 9NF and Carly Road, Greatford,
Stamford, Lincolnshire, PE9 4PR
United Kingdom

has been approved by Lloyd’s Register Quality Assurance
to the following Quality Management System Standards:

BS EN ISO 9001:2008

The Quality Management System is applicable to:

Design and manufacture of gas springs, actuators, hydraulic
shock absorbers, dampers and cylinders and related
servicing products, including gauging and filling systems.

Approval
Certificate No: LRQ 0953426

Original Approval: 23 January 1997

Current Certificate: 1 February 2012

Certificate Expiry: 31 January 2015

Issued by: Lloyd’s Register Quality Assurance Limited

LRQA Business Assurance
Welcome to our current catalogue. We have incorporated many important changes and recent developments into our product ranges and have represented most of them in this catalogue. However, if the products shown do not match your exact requirements please contact our Technical Sales Department tel +44 (0)1778 561422, fax +44 (0)1778 560400.

Gas spring applications have expanded from the familiar car tailgate into every field of commerce, communication and technology. Gas springs can now be routinely found in marine installations of all types as well as furniture, commercial and domestic vehicles, printers, processing equipment and materials handling equipment and food processing equipment. In fact they can be used wherever a lightweight, reliable and consistent counterbalance system is needed.

Gas spring life can now be extended to millions of cycles and also into areas formerly thought of as too hostile. With the application of stainless steels and specially manufactured seals we can now even see gas springs operating in caustic or acid tanks and areas of high dust pollution. On furnaces the latest Tension Springs are counterbalancing heavy covers in very high temperatures.

Special Projects can be undertaken by our Technical Department who will assist and advise your own staff from conception of the project to completion. Information can be quickly shared using the latest CAD systems – almost all CAD formats can be interchanged communicating via the Internet on our website www.gas-springs.com or by email on sales@gas-springs.com.

Product Support can be provided not only by ALROSE PRODUCTS LTD but also by our expanding network of distributors and agents throughout the world. Currently our main resellers and distributors are as follows:

USA: Izerwaren Inc., 2207 South Andrews Avenue, Fort Lauderdale, Florida 33316, USA
Email: info@gassprings.net; Tel: (00 1) 954 763 6686; Fax: (00 1) 954 522 6903

FRANCE: Kent Marine Equipment, 3 Rue De La Dutée B.P. 40207, 44815 Saint Herblain Cedex, France
www.kent-marine.com; Tel: (00 33) 2409 21584; Fax: (00 33) 2409 21316;
Email: tech5@kent-marine.com

ITALY: King S.R.L., Via Einaudi N. 17/A, 61032 FANO (PU), Italy
Email: info@art-inox.com; Tel: (00 39) 0 721 85691; Fax: (00 39) 0 721 856971

ITALY: Osculati spa, Via Pacinotti, 12, 20090 Segrate (MI), Italy
Email: info@osculati.it; Tel: (00 39) 02 2699 1150; Fax: (00 39) 02 2699 1120

UK: Signet, South Yard, Wicks Farm, Ford Lane, Ford, Arundel BN18 0DF, England
Email: sales@signetlocks.co.uk; Tel: (00 44) 845 0700 852; Fax: (00 44) 845 0700 855

ALROSE PRODUCTS LTD are quality assured by Lloyds to ISO 9001:2008 assurance for you and for your customers. Our flexible approach will give you the confidence to work with us and we will provide systems and information to assist you at all stages.
TECHNICAL INFORMATION

GENERAL: Force and Temperature

There are four main types of gas springs which are described in individual sections of this catalogue, with drawings and photographs to illustrate the differences. They come under the headings of Compression Gas Springs, Tension Gas Springs, Locking Gas Springs and Dampers/Gate Closers.

Mounting for your equipment is achieved by an extensive range of end fittings in a variety of materials. These are shown within each section with the relevant type of gas spring. In general Compression gas springs should be mounted so they are rod down in the position in which they spend the most time. This is to allow the oil contained within gas spring to lubricate the rod seals. On no account should external lubrication be applied to the gas spring as this may contaminate the seals and reduce the life of the unit. Tension springs are less susceptible to seals drying out than compression springs and can usually be mounted in any direction. Please note that due to the structure of Tension springs it is not possible to control the damping to the same extent as it is with Compression springs.

FORCE / TEMPERATURE

The force in a gas spring varies by 0.34% per 1°C.

Example shows how a gas spring with a nominal rating of 100N is affected by temperature change.
TECHNICAL DATA

GAS SPRINGS

Compression:
A gas spring in compression is similar to a coil-spring but normally much "flatter".

Tension:
Tension performance is relative to internal oil zone towards end of stroke. Typical curve shown

Friction and compressed force varies with seal type, viscosity and quantity of oil, orifice. F1 is the "standard" force. FS-F1 & F4-F2 are the friction values.

DAMPERS
Dampers are energy absorbing devices of adjustability. Custom orificing gas pressurisation and fluid viscosity selection ensure optimum speed control
INSTALLATION - MOUNTING AND LIFE

Standard practice is to MOUNT ROD DOWN where practicable. Our normal duty Units in standard form allow you to come up to just below the horizontal. This mounting practice is important in preventing seals drying out and reducing the normal life. Storage - similarly store with rod down if possible.

If, for example, the rod must be mounted and worked upwards, then we need to fit special seals at extra cost.

The life-cycle of a Gas Spring should, in general, exceed 20,000 cycles. Most of our Gas Springs are rated at 100,000 cycles standard for normal application. A standard Gas Spring is not a high speed device and no more than four cycles per minute should normally be used for two reasons - product life and heat dissipation.

For special applications, we have been asked to make Gas Springs capable of much higher cycling speeds and longer lives. We then need to know and advise on temperature and frequency of operation in order to work out a solution.
ORDER REFERENCE CODES
COMPRESSION GAS SPRINGS

ORDER EXAMPLE.

| G | 6 - 15 - 200 - | 550 - | V | WE, | E/A/E | 100N |

- G = COMPRESSION SPRING
- L = LOCKING SPRING
- ROD DIAMETER
- BODY DIAMETER
- STROKE LENGTH

FORCE IN NEWTONS
END FITTING ON BODY
END FITTING ON ROD
VALVED
EXTENDED CENTRES TO CENTRE OF END FITTINGS OR TO INSIDE THREAD DIMENSION WHEN SUPPLIED WITHOUT ENDS

THREAD SIZE BODY M
THREAD SIZE ROD M

PUSH IN FORCE
NEWTON OR LBF

GAS SPRING IS SHOWN IN ITS NORMAL POSITION PRIOR TO MOUNTING. I.E. WITH ROD OUT

LOCKING GAS SPRINGS HAVE A PLUNGER ONE END OR THE OTHER

END FITTINGS REQUIRED

- EYE END
- FORK END
- RIGHT ANGLE BALL JOINT

STAINLESS

SPECIAL ENDS CAN BE SUPPLIED ON REQUEST

If in doubt ask
ORDER REFERENCE CODES
TENSION GAS SPRINGS

ORDER EXAMPLE:

T = TENSION SPRING

TENSION SPRING

ROD DIAMETER
BODY DIAMETER
STROKE LENGTH

PULL OUT FORCE

NEWTON OR LBF

EXTENDED CENTRES WHEN SUPPLIED WITH END FITTINGS

EXTENDED CENTRES-NO END FITTINGS SUPPLIED

INSIDE THREADS

ORDER EXAMPLE:

T 6 - 18 - 200 - 550 - V WE, E/A, E 100N

FORCE IN NEWTONS
END FITTING ON BODY
END FITTING ON ROD
VALVED
EXTENDED CENTRES TO CENTRE OF END FITTINGS
OR TO INSIDE THREAD DIMENSION WHEN SUPPLIED
WITHOUT ENDS

ROD END
BODY DIAMETER

INSIDE THREADS

END FITTINGS REQUIRED

EYE END
A OR AS
STAINLESS

FORK END
G OR GS

THREAD SIZE

RIGHT ANGLE
BALL JOINT
WE OR WS
OR WN

SPHERICAL
SP OR SPS

SPECIAL ENDS CAN BE SUPPLIED ON REQUEST

MODEL RANGE:- 6-18, 10-28, 10-38

If in doubt ask
Choose the appropriate type of gas spring. Review the application, is a Compression or Tension gas spring required? Compression gas springs have the rod out and the load from the application forces the rod in. Tension gas springs have the rod in and the load from the application pulls the rod out. Dampers usually provide little force but modify the movement of the load in terms of velocity and acceleration. It may be that a combination of gas spring force and damping is required.

Note the environment in which the gas spring will be operating. Is it indoor or outdoor? Is it corrosive or abrasive? Is it a food process requiring stainless steel with vegetable oil lubricant? What are the temperatures likely to be?

To the best of our belief all the galvanic chromed plated parts in our products are ZEROVALENT which means they are toxicologically inactive and therefore result in zero contamination of foodstuff. It is recommended that customers in the food, drinks and pharmaceutical fields using our stainless products ask for the hard chrome plated rod option.

Choose the appropriate range of gas springs. By analysing the weight, and therefore the force, the point at which it pivots or moves around and the relative mounting position of the gas spring or springs we can calculate the force required to counter balance it. This is usually done by taking moments around the pivot point. A simple example is shown below:

For a horizontal hatch or lid the most common mounting point is 20% of the length of the lid out and down from the pivot. If we fit two gas springs then the equation will be:-

\[(W \times 10) \text{ Newtons } \times \text{ horizontal (to C of G ) } = 2 \times F \times \text{ PERP, where } F = \text{ force in gas spring}\]
**SELECTION**

**CHOICES WHEN ORDERING**

Queries regarding calculations can be referred to the Technical Sales Department on +44 (0)1778 561422. If you have technical expertise and equipment on site you may have the gas springs supplied at maximum pressure (200 bar) for adjusting down. ALROSE PRODUCTS LTD can supply screw on adjusters and gauging equipment for customers’ use. See Adjusters and Portatable Guaging Equipment - "Portatac".

Sending calculations to ALROSE PRODUCTS LTD can be done by email, fax or post. Queries will be processed as quickly as possible, usually within three days. We need to know weights, pivot points, opening distances/angles, possible mounting areas and restrictions, and environment.

**CHOICES FOR ORDERING AND HOW TO WORK OUT YOUR REQUIREMENTS**

A = Stroke  
B = Minimum extended length calculation (mm)  
L = Length  

To calculate B use this formula:  
\[ B = 2 \times A + 36 \] (end valve option)  

To calculate centre of end fittings:  
\[ B + L_1 + L_2 \]

**TYPICAL ORDER EXAMPLE:**

G8 18 100 274 V A19/A19 100N  

**MATERIAL OPTIONS:**

Carbon steel hard chrome plated rod (HCP)  
Carbon steel tube with black coated plastic (BCP)  
316 stainless steel rod, Titanium Rod  
316 stainless steel body, Titanium Body  

**OPTIONS FOR A MODEL 8-18:**

Unvalved (factor is 36)  
End valve (factor is 36)  
Side Valve (factor is 47.5)  
Anti-buckle sleeve (factor is 60)  
M6 x 6.5mm long threads
PRESSURE ADJUSTMENT

A range of accessories is available to suit the various Alrose Gas Springs.

Portable Gauging System (Portatac®)

Our unique portable guaging system allows for accurate downward adjustment of pressure and therefore, force in all ranges of Gas Springs. Supplied with a set of standard adaptors or specials made to suit customers’ individual requirements.

Simple Adjuster for trial and error adjustment

The Adjuster allows the pressure to be reduced in the gas spring and gives more control than tapping the valve with a rod. Available in threads M5, M8 & M10

To assemble screw the sleeve onto the valve end of the gas spring (you will find the valve located under the body end fitting) and turn gently until a slight resistance is felt. Turning the adjuster further on will open the valve and allow the gas to escape – always point the unit away from yourself and other people! Be ready to back off the adjuster once a small amount of gas has escaped, test the operation of the gas spring and if further adjustment is necessary proceed in small stages. If you let out too much gas the unit will have to be returned to us for recharging for which there is a minimum order charge.
‘Portable’ Filling Equipment

For some years we have supplied a sophisticated and complete filling system for customers who take large numbers of adjustable Gas Springs and then tune them to suit the weight of their variable products.

However, some customers have an occasional need for filling possibly smaller quantities of Gas Springs, and for this reason we have developed the basic unit shown in the illustration, which is available with adaptors to suit all the adjustable Gas Springs we produce.

This unit is simply operated by turning Control ‘A’ until the required pressure is seen on Gauge ‘A’, then shutting it off. Normally this will rise above the required pressure relative to force. Then bleed Valve ‘B’ is opened until the pressure actually required is shown on Gauge ‘B’ when the bleed Valve ‘B’ is closed down, the adaptor can be taken off the Gas Spring.

We supply charts which relate BAR pressure to all the Gas Spring forces required in Newtons.
Compression Gas Springs are basically a cylinder of high carbon or stainless steel enclosing a piston with a rod attached. The piston will usually have a throttle or orifice in it to allow the pressure on either side of it to equalise. The cylinder is filled with inert nitrogen gas to a pressure which forces the rod out of the cylinder at the required level of force, usually measured in Newtons. Various standard sizes of rod and cylinder are used to make a range of sizes of gas spring which cover most applications. By varying the design of the piston, seals and bearings and by modifying the quantity and viscosity of the lubricating oil we can provide gas springs with different operating characteristics.

The operating characteristics of a gas spring compared to a coil spring give the benefits of additional damping, not available with a coil spring, and a much flatter spring rate. Higher oil quantities required for extra damping increase the compression ratio of the gas spring and so give a higher spring rate, which is advantageous in some situations and not in others.

ANATOMY OF A STANDARD COMPRESSION GAS SPRING
COMPRESSION GAS SPRING - MODEL G3-10
STROKES from 10mm to 110mm
FORCE from 10N to 120N

MATERIAL OPTIONS:
- Rod - Hard chrome plated carbon steel (HCP)
  316 Stainless steel
- Body - Carbon steel tube with black coated plastic (BCP)
  316 Stainless steel
CR = 1.2
OPTIONS:
- End Valve

Internal Component factor (CF) - 29mm
Standard model with threaded end all with valves
316 stainless steel

B = Extended length calculation (mm)
A = Stroke
B = 2 * A + 29 (CF)
with end fittings = B + L1 + L2

ORDER EXAMPLE:
G3.5 10 100 251 V A11/A11 120N
(showing minimum extended length)

Model G3-10 (Rod 3.5, Body 10)
Only available in 316 stainless steel. This is our miniature gas spring, the smallest we currently do and is ideal for small flaps and cover lifts. It is also available as a hydraulic damper. Strokes are from 10mm up to 110mm. Force available precharged from 10N to 120N.

Other Ranges: GS2-6, GS3-8. Details on application.
Model G4-12 (Rod 4, Body 12)
Available in carbon and stainless steel. The rod diameter is 4mm, the body diameter is 12mm. This is a miniature size gas spring which due to the production quantities will be more expensive than the larger G6-15 model. It is usually used on very fine or small instruments or where access is strictly limited. Strokes from 10mm to 150mm can be accommodated and force range is 10N to 150N.
**COMPRESSION GAS SPRING**

**STROKES from 10mm to 150mm**

**FORCE from 10N to 150N**

**MARINELINE™ MODEL GS4-12**

**DIRECTION OF THRUST**

Standard model with threaded ends with option of **no valve (U)** or **end valve (V)**

**MATERIAL:**
Rod - 316 Stainless Steel Hard Chrome Plated (HCP)
Body - 316 Stainless Steel

Internal Component factor (CF) - 29mm

A = Stroke
B = Minimum extended length calculation (mm)
B = 2 × A + 29mm (CF)
with end fittings = B + L1 + L2

**ORDER EXAMPLE**
WITH END VALVE:
GS4 12 80 213V AS1200/AS1200 100N
(showing minimum extended length)

CR = 1.25

**Marineline™**

Model GS4-12 (Rod 4, Body 12)

Also available in carbon steel. The rod diameter is 4mm, the body diameter is 12mm. This is a miniature size gas spring which due to the production quantities will be more expensive than the larger G6-15 model. It is usually used on very fine or small instruments or where access is strictly limited. Strokes from 10mm to 150mm can be accommodated and force range is 10N to 150N.
COMPRESSION GAS SPRING
STROKES from 10mm to 200mm
FORCE from 25N to 400N

MODEL G6-12

Model G6-12 (Rod 6, Body 12)
Also available in 316 stainless steel - See MARINELINE™. The rod diameter is 6mm, the body diameter is 12mm. This is also a non-standard size gas spring which due to the production quantities will be more expensive than the larger G6-15 model. It is usually used on very fine or small instruments or where access is strictly limited. Strokes from 10mm to 200mm can be accommodated. Force range is 25N to 400N.
COMPRESSION GAS SPRING
STROKES from 10mm to 200mm
FORCE from 25N to 400N

MARINELINE™
MODEL GS6-12

Standard model with threaded ends with option of no valve (U) or end valve (V)

MATERIAL:
Rod - 316 Stainless Steel Hard Chrome Plated (HCP)
Body - 316 Stainless steel

Internal Component factor (CF) - 29mm

A = Stroke
B = Minimum extended length calculation (mm)
   B = 2 x A + 29mm (CF)
   with end fittings = B + L1 + L2

ORDER EXAMPLE
WITH END VALVE:
GS6 12 100 261 V AS1600/AS1600 400N
(showing minimum extended length)
CR = 1.3

Model GS6-12 (Rod 6, Body 12)
Also available in carbon steel. The rod diameter is 6mm, the body diameter is 12mm. This is also a non-standard size gas spring which due to the production quantities will be more expensive than the larger G6-15 model. It is usually used on very fine or small instruments or where access is strictly limited. Strokes from 10mm to 200mm can be accommodated. Force range is 25N to 400N.
**COMPRESSION GAS SPRING**

STROKES from 10mm to 200mm

FORCE from 25N to 400N

MODEL G6-15

Carbon Steel

MODEL G6-15 (Rod 6, Body 15)

Also available in 316 stainless steel - See Marine Line™. The rod diameter is 6mm, the body diameter is 15mm. This is a **standard** size gas spring that can be used in many smaller applications. Strokes from 10mm to 200mm can be accommodated and force range is 25N to 400N.
COMPRESSION GAS SPRING
STROKES from 10mm to 200mm
FORCE from 25N to 400N

MARINELINE™
MODEL GS6-15

Standard model with threaded ends
with option of no valve (U)
or end valve (V)

MATERIAL:
Rod - 316 Stainless Steel Hard Chrome Plated (HCP)
Body - 316 stainless steel

Internal Component factor (CF) - 29mm

A = Stroke
B = Minimum extended length calculation (mm)
   B = 2 X A + 29mm (CF)
   with end fittings = B + L1 + L2

ORDER EXAMPLE
WITH END VALVE:
GS6 15 100 261V AS1600/AS1600 400N
(showing minimum extended length)
CR = 1.22

Model G6-15 (Rod 6, Body 15)
Also available in carbon steel. The rod diameter is 6mm, the body diameter is 15mm. This is a standard size gas spring that can be used in many smaller applications. Strokes from 10mm to 200mm can be accommodated and force range is 25N to 400N.
COMPRESSION GAS SPRING
STROKES from 20mm to 250mm
FORCE from 50N to 750N

MODEL G8-18
Carbon Steel

Model G8-18 (Rod 8, Body 18)
Also available in 316 stainless steel - see MARINELINE™. The rod diameter is 8mm, the body diameter is 18mm. This is a standard size gas spring that can be used in many smaller to medium sized applications. Strokes from 20mm to 250mm can be accommodated and force range is 50N to 750N.
COMPRESSION GAS SPRING
STROKES from 20mm to 250mm
FORCE from 50N to 750N

MARINELINE™
MODEL GS8-18

Standard model with threaded ends
with option of no valve (U)
or end valve (V)

MATERIAL:
Rod - 316 Stainless Steel Hard Chrome Plated (HCP)
Body - 316 Stainless Steel

Internal Component factor (CF) - 36mm

A = Stroke
B = Minimum extended length calculation (mm)
B = 2 \times A + 36(CF)
with end fittings = B + L1 + L2

ORDER EXAMPLE WITH END VALVE:
GS8-18-100-274-V-AS1900/AS1900
750N
(showing minimum extended length)
CR = 1.35

Model GS8-18 (Rod 8, Body 18)
Also available in carbon steel. The rod diameter is 8mm, the body diameter is 18mm. This is a standard size gas spring that can be used in many smaller to medium sized applications. Strokes from 20mm to 250mm can be accommodated and force range is 50N to 750N.
COMPRESSION GAS SPRING - MODEL G10-23
STROKES from 20mm to 350mm      Carbon Steel
FORCE from 50N TO 1250N

Standard model with threaded ends with option of no valve (U) or end valve (V)

MATERIAL:
- Rod - Hard chrome plated carbon steel (HCP)
- Body - Carbon steel tube with black coated plastic (BCP)

Internal Component factor (CF) - 44mm
A = Stroke
B = Minimum extended length calculation (mm)
B = 2 X A + 44 (CF)
with end fittings = B + L1 + L2

ORDER EXAMPLE WITH END VALVE:
G10 23 200 294 V AE1901/WE3000 500N
(showing minimum extended length)

CR = 1.3

Model G10-23 (Rod 10, Body 23)
Also available in stainless steel - See MARINELINE™. The rod diameter is 10mm, the body diameter is 23mm. This is a standard size gas spring that can be used in many medium sized applications. Strokes from 20mm to 350mm can be accommodated and force range is 50N to
COMPRESSION GAS SPRING - MODEL G10-23
STROKES from 350mm to 500mm with anti buckle sleeve
FORCE from 50N to 1250N  Carbon Steel

Model G10-23 (Rod 10, Body 23)
Also available in stainless steel - See MARINELINE™. The rod diameter is 10mm, the body diameter is 23mm. This is a standard size gas spring that can be used in many medium sized applications. Strokes from 350mm to 500mm can be accommodated and force range is 50N to 1250N.
COMPRESSION GAS SPRING
STROKES from 20mm to 350mm
FORCE from 50N to 1250N

MARINELINE™
MODEL GS10-23

Model G10-23 (Rod 10, Body 23)
Also available in carbon steel. The rod diameter is 10mm, the body diameter is 23mm. This is a standard size gas spring that can be used in many medium sized applications. Strokes from 20mm to 350mm can be accommodated and force range is 50N to 1250N.
COMPRESSION GAS SPRING
STROKES from 350mm to 500mm
FORCE from 50N to 1250N

MARINELINE™
MODEL GS10-23
ANTI BUCKLE STAINLESS

Model G10-23 (Rod 10, Body 23)
Also available in carbon steel. The anti buckle sleeve stabilises the gas spring for long strokes.
The rod diameter is 10mm, the body diameter is 23mm. This is a standard size gas spring
that can be used in many medium sized applications. Strokes from 230mm to 500mm can
be accommodated and force range is 50N to 1250N.
**COMPRESSION GAS SPRING - MODEL G10-28**

STROKES from 20mm to 350mm  
FORCE from 50N to 1250N  
Carbon Steel

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**Model G10-28**

Also available in carbon steel. The anti buckle sleeve stabilises the gas spring for long strokes. The rod diameter is 10mm, the body diameter is 28mm. This is a standard size gas spring that can be used in many medium sized applications. Strokes from 20mm to 350mm can be accommodated and force range is 50N to 1250N.
**COMPRESSION GAS SPRING**

**STROKES** from 20mm to 350mm

**FORCE** from 50N to 1250N

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**MARINELINE™**

**MODEL GS10-28**

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**Standard model with threaded ends with option of no valve (U) or end valve (V)**

**MATERIAL:**
- **Rod** - 316 Stainless Steel Hard Chrome Plated (HCP)
- **Body** - 316 Stainless Steel
- **Internal Component factor (CF)** - 50mm

A = Stroke  
B = Minimum extended length calculation (mm)  
B = 2 X A + 50 (CF)  
with end fittings = B + L1 + L2

**ORDER EXAMPLE WITH END VALVE:**

GS10 28 300 712 V- AS2700/WS3500 ABS 500N (showing minimum extended length)

CR = 1.3

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**Model G10-28**

Also available in carbon steel. The anti buckle sleeve stabilises the gas spring for long strokes. The rod diameter is 10mm, the body diameter is 28mm. This is a **standard size** gas spring that can be used in many medium sized applications. Strokes from 20mm to 350mm can be accommodated and force range is 50N to 1250N.
Model G14-28

Also available in stainless steel - see MARINELINE™. The rod diameter is 14mm and the body diameter is 28mm. This is a standard size gas spring that can be used in many medium to larger applications, such as heavy marine hatches or food processing machinery.
COMPRESSION GAS SPRING -
STROKES from 20mm to 1500mm
FORCE from 150N to 2500N

MARINELINE™
MODEL GS14-28

Model GS14-28
Also available in carbon steel. The rod diameter is 14mm and the body diameter is 28mm.
This is a standard size gas spring that can be used in many medium to larger applications,
such as heavy marine hatches or food processing machinery.
COMPRESSION GAS SPRING - MODEL G22-38
STROKES from 50mm to 1500mm
FORCE from 300N to 7500N
Carbon steel

Model G22-38 (Rod 22, Body 38)
Also available in stainless steel - See MARINELINE™. The rod diameter is 22mm, the body diameter is 38mm. This is a standard size gas spring that can be used in many larger applications. Strokes from 50mm to 1500mm can be accommodated and force range is 300N to 7500N. This is also available as a demountable version.
COMPRESSION GAS SPRING
STROKES from 50mm to 1500mm
FORCE from 300N to 7500N

MODEL GS22-38

Model G22-38 (Rod 22, Body 38)
Also available in carbon steel. The rod diameter is 22mm, the body diameter is 38mm. This is a standard size gas spring that can be used in many larger applications. Strokes from 50mm to 1500mm can be accommodated and force range is 300N to 7500N. This is also available as a demountable version.
COMPRESSION GAS SPRING - MODEL G30-65

Maximum force 10,000N

Carbon Steel

With Thread

<table>
<thead>
<tr>
<th>Stroke</th>
<th>Length without ends</th>
<th>Length with clevis</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>320</td>
<td>520</td>
</tr>
<tr>
<td>200</td>
<td>520</td>
<td>720</td>
</tr>
<tr>
<td>300</td>
<td>720</td>
<td>920</td>
</tr>
<tr>
<td>500</td>
<td>1120</td>
<td>1320</td>
</tr>
<tr>
<td>750</td>
<td>1620</td>
<td>1820</td>
</tr>
<tr>
<td>1000</td>
<td>2120</td>
<td>2320</td>
</tr>
</tbody>
</table>

Each Gas Spring as standard is supplied with an Axial Vent Valve in the threaded stud.

Forks and threaded ends are supplied as standard.

Special lengths available.

Special Range:
A radial reducing and filling valve can be supplied with M10x1 connection on the cylinder end.

Special high-pressure hoses for remote filling and reducing can be supplied.

CR = 1.35

Component factor = 160

Model G30-65 (Rod 30, Body 65)
**TENSION GAS SPRINGS**

*Introduction and description*

**Tension Gas Springs** have an extra tube within the outer cylinder and the internal nitrogen gas pressure forces the piston and rod inside itself. The displaced gas is contained within the outer cylinder as the rod is withdrawn from the body. Damping cannot so easily be controlled with this two cylinder system because of the radial transfer holes which are needed to allow the movement of the nitrogen between the two chambers.

**New with Valve**
This new design permits much greater flexibility in the supply of Tension Gas Springs.

**Important Technical Improvements**
Our new kind of construction allows us to make Tension Gas Springs in almost unlimited strokes and total lengths. These Gas Springs will generally be supplied with valves as standard so that the user can adjust the force if required, formerly not possible with small diameter Tension Gas Springs.

**An Important Recommendation**
We suggest that the Tension Gas Spring be fitted both ends with the **AS SPHERICAL JOINT LINK** which removes all side-force from the unit, giving an enormous benefit to its life-span.
Model T6-18
Available in carbon and stainless steel. The rod diameter is 6mm, the body diameter is 18mm. This is a standard size gas spring that can be used in many small to medium applications. Strokes from 20mm to 200mm can be accommodated and force range is 25N to 400N.

MATERIAL
Rod – 316 Stainless Steel Hard Chrome Plated HCP
Body – Carbon steel

Internal Component Factor (CF) 67mm
A = Stroke
B = Minimum extended length calculation (mm) 
B = 2 x A + 67 (CF) with end fittings = B + L1 + L2

ORDER EXAMPLE
T6 18 100 305 V AE1600/WE2200 300N
CR = 1.3
Model T10-28
Available in carbon and stainless steel. The rod diameter is 10mm, the body diameter is 28mm. This is a standard size gas spring that can be used in many medium to large applications. Strokes from 20mm to 500mm can be accommodated, force range is 50N to 1250N.

STROKES from 20mm to 500mm
FORCE from 50N to 1250N  Carbon Steel

Standard model with either M10 or M8 threads.

MATERIAL
Rod – 316 Stainless Steel Hard Chrome Plated (HCP)
Body – Carbon steel

Internal Component Factor (CF)
107mm
A = Stroke
B = Minimum extended length calculation (mm)
B = 2 x A + 107 (CF)
with end fittings = B + L1 + L2

ORDER EXAMPLE
T10 28 250 656 V AE1901/WE3000 500N
CR = 1.3
TENSION GAS SPRING - MODEL T10-38
STROKES from 50mm to 1000mm
FORCE from 100N to 2500N Stainless Steel

Model T10-38
Available only in stainless steel. The rod diameter is 10mm, the body diameter is 38mm. This is a standard size gas spring that can be used in heavier duty applications. Strokes from 50mm to 1000mm can be accommodated and force range is 100N to 2500N.

TENSION GAS SPRING
STROKES: 50mm to 1000mm
FORCE: 100N to 2500N
Stainless Steel

Standard model with either M14 x 1.5 or M10 threads.

MATERIAL
Rod – 316 Stainless Steel Hard Chrome Plated (HCP)
Body – Carbon steel

Internal Component Factor (CF)
121mm

Order Example
TS10 38 500 1207 V ASPS4300/ ASPS4300 2000N
CR = 1.3
LOCKING GAS SPRINGS

Introduction and description

STANDARD LOCKING RANGES

All available either as springy or rigid locking. For Absolute rigid locking consult us.

The function of the Locking Gas Spring is based on the same basic physical principle as the normal Compression Gas Spring. The difference between it and the Gas Spring is that the flow through the piston can be closed from the outside. The locking valve is automatically closed by the pressure of the gas. It acts as a small piston rod.

By pushing the pin extending out of the piston rod, the locking valve can be opened. The filling medium, nitrogen, can flow, and the piston rod extends.

When the piston rod is correspondingly loaded and the valve opened, the piston rod is, of course, pushed in.

Procedure

When the valve pin is released, the pressure of the gas automatically closes the valve, and fixes the piston rod in place. The ratio of the piston rod area to the valve area is 4:1. It follows, therefore, that the release pressure for the valve is theoretically 1/4 of the extension force of the piston rod.

In practice, the force required to break loose the rubber seals must be added so that with increasing time, a higher valve force is required for the first actuation (stiction). Exact data for the individual types can be found by trial.

The release travel for the valve is between 0.2mm and 1mm

We have the following differences in function in:

1. ELASTIC LOCKING (unlike the diagram there would be no oil to lock on)
2. RIGID LOCKING as in the diagram the piston locks within an oil volume which is trapped by a separating piston. For most practical applications this provides a degree of rigidity which is satisfactory. In round terms eight times the nominal force in tension, four times the nominal force in compression.
3. WE HAVE WAYS OF MAKING AN ENTIRELY RIGID OPERATION IN EITHER COMPRESSION OR EXTENSION. PLEASE ADVISE US IF YOUR APPLICATION DEMANDS A FUNCTION LIKE THIS.

The various functions above can not be distinguished externally. However, we can normally make an elastic locking version some 20 to 50mm shorter.
It is permissible to mount our Locking Gas Springs in any plane.
LOCKING GAS SPRING - MODEL L10-23
STROKES from 20mm to 500mm
FORCE from 100N to 1250N

Carbon Steel

Model L10 - 23 - Normal Duty
Stroke up to 500mm. Force up to 1250N. Also available stainless steel.
LOCKING GAS SPRING
STROKES from 20mm to 500mm
FORCE from 100N to 1250N

MARINELINE™
MODEL LS10-23

Standard model with threaded ends
with option of no valve (U)
or end valve (V)

MATERIAL:
Rod - 316 Stainless Steel Hard Chrome Plated (HCP)
Body - Carbon steel

Internal Component factor (CF)
Calculated as 2.45 x stroke + 90
e.g. for a stroke of 100 the CF becomes 335

A = Stroke
B = 2.45 x stroke + 90

with end fittings = B + L1 + L2

ORDER EXAMPLE WITH END VALVES:
L10 23 100 354 V M10/AS1900 500N
(showing minimum extended length)

CR = 1.5

With gas bearings
LOCKING GAS SPRING - MODEL L10-28

STROKES from 20mm–1000mm
FORCE from 100N to 1250N

Carbon steel

Model L10 - 28
Stroke up to 1000mm. Force up to 1250N. Available in carbon or stainless steel.
LOCKING GAS SPRINGS
STROKES from 20mm–1000mm
FORCE from 100N to 1250N

MARINELINE™
MODEL LS10-28

LOCKING MODEL with threaded ends with option of no valve (U) or end valve (V)

MATERIAL:
Rod - 316 Stainless Steel Hard Chrome Plated (HCP)
Body - Carbon steel

Internal Component factor (CF) Calculated as 2.5 x stroke + 90
E.g. for a stroke of 100 the CF becomes 340

A = Stroke
B = 2.5 x stroke + 90
with end fittings = B + L1 + L2

ORDER EXAMPLE
WITH END VALVE:
LS10 28 100 340 V M10/AS1900 500N
(showing minimum extended length)

CR = 1.45

With IGUS bearings
Release Mechanisms for Locking Gas Springs

The illustration shows two types of mechanism now available for the release and containment of our Locking Gas Springs. Type 1 is a Lever Operated device, for example which can go under a seat or flap, Type 2 is a Cable Operated device, where you may have to take a cable to a remote position for operating and releasing the Gas Spring.

It should be borne in mind that to return the lifted flap or other attachment, then the release unit must be engaged while the attachment is manually returned to the closed position.

In the past most customers have made their own equipment for the release function of Locking Gas Springs. However, our Marketing Research showed there was a need for this equipment to be readily available as a purchasable part which is relatively inexpensive.

HYDRAULIC MECHANISMS ARE NOW AVAILABLE AS ALTERNATIVES TO TYPE 1 AND 2. PLEASE ASK OUR SALES DEPARTMENT FOR DETAILS.

Model L14 - 38 - Heavy Duty - Higher Force
Stroke up to 1500mm. Force up to 2500N. Available in carbon or stainless steel. The force range up to 2500N will achieve a locking force up to 8 times the rated force in compression, and 16 times in extension.

Technical drawing available on request.
Almost any Gas Spring can be produced as a damper in various combinations of hydraulic and gas/oil systems with speeds calibrated for special needs and installations.

The most economical damper is a look-alike Gas Spring with an oil filling in the various materials that Gas Springs are finished in.

The most complex is a two-way hydraulic adjustable damper which can also be readily located in position. Apart from the lookalikes we make all other types to special customers' orders.

For something a little less complex than the above, we can make factory only adjustable types of dampers.

Gas Strut Damping
Applicable to Standard Compression and Locking Gas Springs

The stroke of the Gas Springs is damped in two modes – gas and oil. The gas is controlled by the size of the orifice which tends to be unchanged for a given Gas Spring size range. It is possible to easily vary the oil damping effect by change of viscosity and quantity. We can also provide damping in compression if required by allowing the piston to run almost wholly in oil. The standard requirement is for damping on extension.

For full end damping, the Gas Spring piston rod must lie well below the horizontal. In general, our Gas Springs are filled with oil to the column heights shown below, although variation would be made for very short strokes.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>G3–10</th>
<th>5mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>G4–12</td>
<td></td>
<td>10mm</td>
</tr>
<tr>
<td>G6–15</td>
<td></td>
<td>15mm</td>
</tr>
<tr>
<td>G8–18</td>
<td></td>
<td>20mm</td>
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<tr>
<td>G10–23</td>
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<td>20mm</td>
</tr>
<tr>
<td>G14–28</td>
<td></td>
<td>35mm</td>
</tr>
<tr>
<td>G22–38</td>
<td></td>
<td>50mm</td>
</tr>
</tbody>
</table>
DAMPERS

ILLUSTRATED - AN HD ADJUSTABLE UNIT 25KN
WE MAKE MANY DAMPERS TO ORDER FROM Ø6 UP TO Ø80 TUBE SIZES
WITH OIL OR GAS & OIL FILL
ADJUSTABLE & NON-ADJUSTABLE IN NORMAL AND STAINLESS STEEL
GATE CLOSERS
GC75 350  316 Stainless Steel

Kit includes:
Part No. GS 10 23 75 350 V WS35000/WS35000 500N
(Two brackets per kit.)
Gate Closer plus Adjuster ADJ101410.
Brackets for kit BKTJFF
(Or sold separately.)

MATL: BLACK BAR NOM 30 x 8
GATE CLOSERS
GC150 500 316 Stainless Steel

Kit includes:
Part No. GS 10 23 150 500 V WS35000/WS35000 500N
(Two brackets per kit.)
Gate Closer plus Adjuster ADJ101410.
Brackets for kit BKTJFF
(Or sold separately.)

MATL: BLACK BAR NOM 30 x 8
CLOSER 250 770

Kit includes:
Part No. GS 10 23 250 770 V WS35000/WS35000 500N
(Two brackets per kit.)
Gate Closer plus Adjuster ADJ101410.
Brackets for kit BKTJFF
(Or sold separately.)

MATL: BLACK BAR NOM 30 x 8
BRACKETS
Hatch mounting - Stainless Steel Polished
HEAVY DUTY

Pt No. 64089
M10 ball joint - hatch mounting for Model 14

Pt No. 64088
M8 ball joint - hatch mounting for Models 8 & 10

Pt No. 64205
M8 eye hatch mounting for Models 8 & 10
BRACKETS
Hatch mounting - Stainless Steel Polished
HEAVY DUTY

Pt No. 64200
Eye hatch mounting for Model 6

Pt No. BRK81014
Universal bracket for all models up to 5000N max compressed force.
HD Stainless Bracket 1.

Pt No. BRK/A/08/006 - 6.2 hole with 6mm pin
Pt No. BRK/A/08/008 - 8.2 hole with 8mm pin
BRACKETS
Hatch mounting - Stainless Steel Polished

316 Stainless Steel

Pt No. 64584
M8 ball joint hatch mounting for Model 8 only

Pt No 64582
M5 ball joint hatch mounting for Model 6
BRACKETS
Bulkhead mounting - Stainless Steel Polished
HEAVY DUTY

Pt No. 64256
M10 ball joint bulkhead mounting for Model 10

Pt No. 64258
M10 bulkhead mounting for Model 10
BRACKETS
Bulkhead mounting - Stainless Steel Polished
HEAVY DUTY

Pt No. 64255
M8 ball joint bulkhead mounting for Model 8

Pt No. 64257
M8 eye bulkhead mounting for Model 8

Pt No. 64250
M5 ball joint bulkhead mounting for Model 6
BRACKETS
Bulkhead mounting - Stainless Steel Polished
LIGHT DUTY

Pt No. 64585
M8 bulkhead mounting for Model 8 only

Pt No. 64583
M5 bulkhead mounting for Model 6
BRACKETS - Galvanised

Model 6
- M5 for A16 & AS16
- Pt No. BRK/A/06/001
- Galvanised

Model 8 and 10
- M8 for A27 & AS27
- Pt No. BRK/A/08/001
- Galvanised

Model 6, 8 and 10
- M8 for A19 & AS19
- Pt No. BRK/A/08/002
- Galvanised

Models
- Pt No. BRK/A/08/003-06
- Galvanised
BRACKETS - Galvanised

Model 6
M5 for WE22 & WS22
Pt No. BRK/WE/08/001
Galvanised

Models 6, 8 and 10
M8 for WE18
M6 for WE25
Pt No. BRK/WE/10/001
Galvanised

Models 8 and 10
M8 for WE30
M6 for WE30
Pt No. BRK/WE/13/001
Galvanised
BRACKETS
LIGHT DUTY - Sizes G3-10, G4-12 & G6-15
Galvanised

Any combination of mounting and terminal is possible

For example order “BB01K08” or “BB20K08” as in photo below.
BRACKETS
Stainless Steel Polished – Heavy Duty

Pt No. 64250
M5 ball joint
bulkhead mounting

Pt No. 64255
M8 ball joint
bulkhead mounting

Pt No. 64257
M8 eye
bulkhead mounting

Pt No. 64256
M10 ball joint
bulkhead mounting

Pt No. 64200
Eye hatch mounting
for Model 6

Pt No. 64205
M8 eye
hatch mounting

Pt No. 64088
M8 ball joint
hatch mounting

Pt No. 64089
M10 ball joint
hatch mounting
Safety Latches – Lock gas Springs when extended
These are indispensable in situations where a hazard might exist, such as on a heavy overhead cover or a machine guard. If a Gas Spring should fail this object could crash and cause damage to life or equipment. On full extension a mechanical catch is automatically engaged and must be manually released.

Protective Tubes and Anti-Buckle Sleeves
The piston rod must not be damaged as otherwise the Gas Springs cannot fulfil their functions reliably. As a precautionary measure, we recommend that for certain applications (e.g. refuse containers, etc.) the springs are provided with a protective tube of steel, stainless steel or fabric bellows. If for some reason a customer wants a long stroke unit and cannot go up a range, then an anti-buckle sleeve must be applied.
GAS VANGS – Sailing Boat Boom Support
316 Stainless Steel

Topping lift may be discarded

About 5°

Use D-rings or similar sliders appropriate to your mast or boom.

A top sheave can be built on to HD Kicker only.

FOR NON-STANDARD KICKERS, LARGE OR SMALL, WE WILL GLADLY SEND YOU A QUOTATION

No. 1 Standard Kicker is suitable for yachts from 25–30 feet.

No. 2 HD Kicker is suitable for yachts from 26–40 feet.

No. 3 Small Kicker is suitable for yachts from 20–25 feet.

A – Normally fit between 30–50° with boom horizontal
SOME TYPICAL APPLICATIONS

Inspection bay for olive pressing machines.

Stainless steel gas spring, which is internally configured to be compatible with food products, operates the cover.

Revelation statue at Chatsworth House UK, by kind permission. Stainless gas dampers control the opening and closing of the massive petals.
SOME TYPICAL APPLICATIONS

Adjustable dampers and small hydraulic cylinders.

Gas spring on indent mechanism.

Gas spring in special hinge range by courtesy PE Marine Designz.

Many types of vangs for boats.

Marine hatches.
TERMS AND CONDITIONS OF SALE

1 General
   a) In the fulfilment of an order these Terms and Conditions shall form the basis of a binding contract between the vendor and the purchaser.
   b) If your official order form contains special printed conditions it is understood that such conditions are only accepted in so far as they are not at variance with these terms and conditions of sale.

2 Prices
   a) Whilst we will make every endeavour to adhere to our quoted prices we reserve the right to amend them to those ruling at the date of despatch.
   b) All orders are subject to a minimum order value of £25.
   c) All prices exclude VAT, carriage and packing, unless especially quoted as inclusive.

3 Postage and Packing
   Postage and packing will be charged at cost on all orders unless stated inclusive.

4 Delivery
   Delivery times are quoted in good faith, but no liability is accepted for failure to despatch within the quoted period.

5 Payment
   Payments for goods and services shall be 2% discount for payment within 14 days or net cash due 30 days from date of invoice. Overdue payments will be subject to interest at the rate of 2% per month or part thereof.

6 Description and Data
   Every effort will be made to ensure the accuracy of technical data or literature relating to the goods but no liability can be accepted by the Seller for any damage or injury arising directly or indirectly from any error or omission in such technical data or literature.

7 Liability
   All goods and services are supplied on the condition that the Seller shall not be liable for any loss, direct or indirect, caused by anything beyond its reasonable control (including industrial disputes) nor for personal injuries or any consequential loss however caused. The Seller shall not be liable for any third party loss or injury however sustained whether applicable to the original customer or a party sold or given on to.

8 Claims and Returns
   a) The Seller guarantees at its discretion to repair or replace free of charge any of the goods found to its satisfaction to be defective within 12 months of the date of delivery owing to faulty design, materials or workmanship, provided the goods have not been modified or repaired by other than the Seller and have been operated, stored and maintained within the Seller’s recommendations for use. In the case of goods not manufactured by the Seller, its liability shall in no circumstances extend beyond the liability to the Seller of the manufacturer of such goods.
   b) Goods returned under this guarantee shall be delivered to the Seller’s premises at the Purchaser’s expense and if found not to be defective (or when the defect is attributable to the Purchaser’s use) will be returned to the Purchaser at its expense and subject to a testing charge of 15% of the invoice price together with VAT thereon if applicable.
   c) In the case of goods repaired or replaced by the Seller, the guarantee shall terminate at the end of the original guarantee period.
   d) If goods are received in a damaged condition, the Carrier’s receipt should be endorsed accordingly and notification sent to us with a copy of the Carrier’s receipt within 48 hours of the receipt of the goods.
e) Goods ordered in error (other than those specially made to Purchaser’s order) may be returned at the Purchaser’s expense, subject to the following conditions:
   i) Our written consent must first be obtained.
   ii) The return must be effected within 30 days from the date of receipt and the goods must be in a saleable condition.
   iii) Acceptable returned goods will be credited at the purchase price less 25% to cover handling and inspection costs together with VAT thereon if applicable.

f) Missing Goods - Any goods which appear to be missing from the package as described by Advice Note, Packing Note, Invoice or any other relevant documentation which will coincide with pre-sent documentation, must be advised to us immediately after the package is opened, accompanied by a digital photo of the package/s exterior and interior occupied space of the goods. If we are not notified within a 48 hour period then the goods are deemed not to be missing.

9 Patent Rights
   a) The Seller reserves to itself the full ownership of all inventions, designs and processes, whether patentable or not, which may be made or evolved by the Seller in the course of any work done under the contract between the Seller and Purchaser.
   b) The Purchaser warrants that any specifications or designs supplied by it to the Seller will not involve the infringement of any patent, registered design or other industrial property right in the manufacture and sale of the goods by the Seller.
   c) The Purchaser undertakes to indemnify and keep indemnified the Seller against all royalties, claims, actions, demands, proceedings, losses and costs in connection with any infringement or alleged infringement of any patent, registered design or other industrial property right in the manufacture, sale or application of the goods arising out of or in connection with the matters described in paragraph 9B.

10 Exhibitions
   The purchaser shall not, without first receiving the Seller’s consent in writing, exhibit goods supplied by the Seller at any exhibition, trade display or other promotion.

11 Title and Risk
   a) The risk of loss or damage to the goods shall pass to the Purchaser at the time of delivery.
   b) The goods shall remain the legal and equitable property of the Seller, and the Purchaser will permit the Seller the right of access to the goods at all times, until payment in full of all monies owed by the Purchaser have been received by the Seller.

12 Termination
   If the Purchaser commits any breach of the terms and conditions of the contract or suffers distress or execution or becomes insolvent or commits an act of bankruptcy or enters into any arrangement or composition with his creditors or goes or is put into liquidation (other than solely for amalgamation or reconstruction while solvent) or if a receiver is appointed over any part of the Purchaser’s business, the Seller may without prejudice to any rights which may have accrued or which may accrue to it terminate the contract summarily by notice in writing.

13 Law
   Any question relating to any quotation or contract subject to these conditions or agreed amendment of these conditions shall be determined in all respects by the laws of England.

14 Severability
   Invalidity or unenforceability of one or more provisions of these Terms & Conditions shall not affect or invalidate any of the other clauses.

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BRITISH GAS SPRINGS
March 2009
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