



LINEAR ACTUATORS FOR:
FREQUENT CYCLING
LONG STILL STAND
CORROSIVE ATMOSPHERES
ON- and OFFSHORE APPLICATIONS

PISTON TYPE LINEAR ACTUATORS

LINEAR ACTUATOR DESIGN:

On offshore locations, such as platforms, FPSO, On Bouy's and Turrets CORROSION of exposed material is an enormous issue. The traditional (well known) actuator suppliers use the tiny designed tie-rodded actuator.

The use of tie-rods avoids the actuator to be coated on the most critical spots of the actuator, the ty-rods will corrode, break and will cause very dangerous situations.

Many customer have recognized this problem and change out the traditional actuators with actuators without the use of tie-rods.

DAC Technologies has designed the new UNIQUE linear actuator and has brand labelled the actuator: ATLAS Actuation.

As conditions become ever more challenging within oil and gas production you need best practice solutions that are safe, reliable and fit for purpose.

Our linear actuator solutions are designed to the most exacting standards and operate in the most hostile environments. Our designs are developed to provide solutions to customer's demands for current and future surface and subsea applications.

DAC Linear actuator is trademarked as Atlas Actuation, the product is engineered and designed fully in accordance with customer demands.



In case space is limited and equipment shall be manufactured as compact as possible

NON-TIE-RODDED DESIGN

DESIGNED FOR FREQUENT CYCLING

DESIGNED FOR LONG STILL STAND



PISTON TYPE LINEAR ACTUATORS

LINEAR ACTUATOR TYPES AND MODELS:

Hydraulic operated:

- Double acting
- Spring to open
- Spring to close

Operating pressures up to 1000 Bar

On / off function

Control function

Pneumatic operated:

- Double acting
- Spring to open
- Spring to close

Operating pressures up to 100 Bar

On / off function

Control function

APPLICATIONS

- High flow
- High temperature
- High pressure
- Abrasive flow
- HIPPS function
- Corrosive environments
- Oil, gas or water
- Pig launcher receiver
- Manifold export and flow lines

SUBSEA

- Subsea isolation SSIV
- Manifold export and flow lines
- Pipeline End Termination (PLET)
- Pipeline End Manifold (PLEM)
- Pig launcher/receiver
- 3000m Deep water

PISTON TYPE LINEAR ACTUATORS

Benefits

DAC actuators, trade marked ATLAS

Actuation:

The company DAC technologies BV, based in the Netherlands is specialized in the design and manufacturing of **linear** Actuators.

Many end-users have chosen for linear actuators supplied by DAC Technologies, because of:

1. - Quality
2. - Performance
3. - Compactness
4. - Service
5. - Delivery time

1.: **Quality:**

1.1: **Non-tie-rod construction:**

DAC pneumatic actuators are made of the **non tie-rod** design, this avoids corrosion of the critical tie-rods which are under continuous exposure to the environmental / weather conditions.

Through the years tie-rods may corrode considerable resulting into actuator damage.

1.2.: **Non-sticking seals:**

The DAC actuator main seal is manufactured from non-sticking Teflon reinforced materials, this avoid sticking of the seal during long still stand.

Other actuator brands use rubber seals which may stick to the cylinder wall during long still stand, causing actuator leakage.

1.3.: **Nickel plating internals:**

Internals (cylinder and piston) are all nickel plated.

1.4.: **Snubber:**

Double acting actuators can be supplied combined with hydraulic snubber systems in order to absorb the shocking effect during opening of the valve often in combination with manual override systems.

2.: **Performance:**

DAC actuators are designed and manufactured for FREQUENT CYCLING operation and for LONG STILL STAND due to the NON STICKING EFFECT soft seals and will match to the exact purpose of the linear operated valve fully in accordance with data as indicated in customer datasheets.

Actuators are designed in close cooperation with the valve designers and engineers that are responsible for the valve, this has resulted into actuator designs that are not up – and / or undersized but manufactured ready for the job.

3.: **Compactness: Dimension savings, through exclusive design:**

DAC actuators are manufactured as compact as possible.

Other than the well known actuator manufactures that uses standard pipes and spring from their shelf, DAC designs each individual actuator in detail in order to select the exact dimension of the cylinder and the spring required.

This aspect results into a product that is made fit for purpose, avoiding an over-designed cylinder diameter supplied with a standard, but made for purpose, spring, saves 30 – 50% height of the actuator, and automatically results into considerable weight saving.

4.: **Service: Availability of parts:**

Main actuator parts and spare parts of DAC actuators are available within the shortest possible delivery time.

5.: **Delivery time:**

Actuators and main actuator parts and spare parts of DAC actuators are available within the shortest possible delivery time, please request the DAC for a quotation.

DAC Technologies BV is a ISO 9001 certified company

DAC Technologies BV designs with Inventor and ANSYS drawing and design program



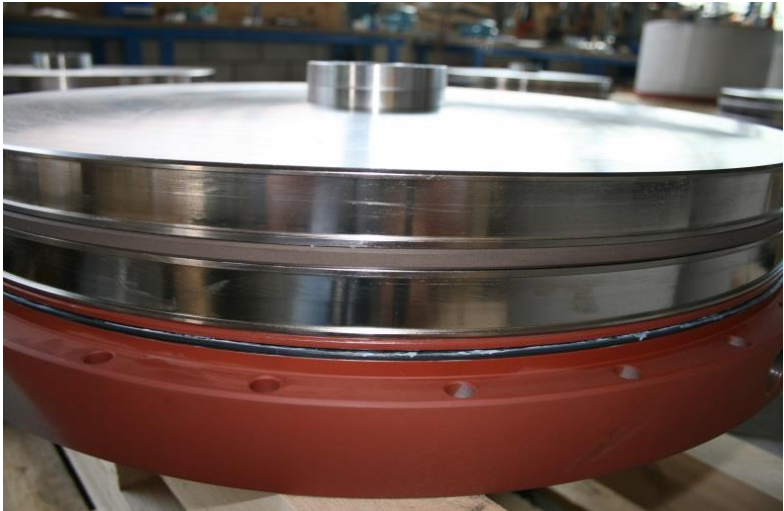
PISTON TYPE LINEAR ACTUATORS



Precision honed cylinder and nickel plated cylinder and piston



COMPACT AND SAFE SPRING DESIGN



UNIQUE SEAL DESIGN

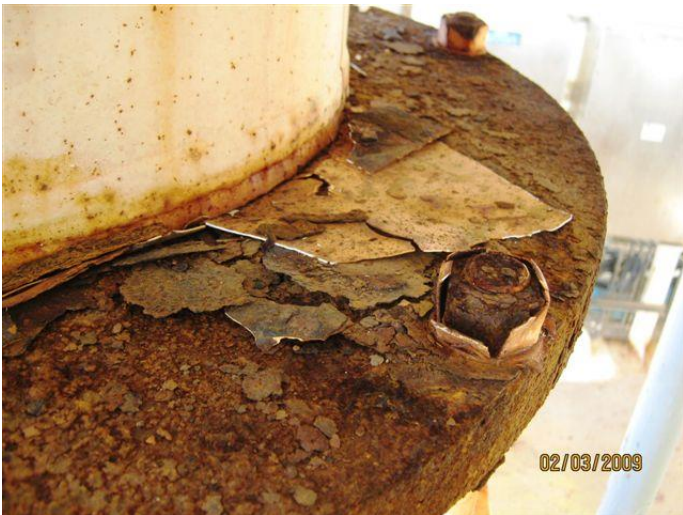


NON-TIE-RODDED DESIGN

PISTON TYPE LINEAR ACTUATORS

Examples of Corrosion issues

This are actual situations of corrosion issues with tie-rodged designed actuators



PISTON TYPE LINEAR ACTUATORS

Selection chart



Date: 15-05-2013

LINEAR PNEUMATIC STANDARD MODELS

Rev. 2

Cylinder diameter	Piston thickness	Piston rod diam.	Piston rod top diam.	Stroke	Add 1:	Add 2:	Add 3:	Weight piston (Newton)	For double acting actuators only, for spring return use SR calculation sheets					Fill-in available Pressure in Bar(g)			
									CLOSED Force in N per bar	CLOSED Force in Kgf per bar	OPEN Force in N per bar	OPEN Force in Kgf per bar					
160	30			***	DA+	***	***	47	2015	N	205	Kgf	1854	N	189	Kgf	1
200	30			***	DA+	***	***	73	3149	N	321	Kgf	2936	N	299	Kgf	1
240	30			***	DA+	***	***	106	4535	N	462	Kgf	4258	N	434	Kgf	1
280	30			***	DA+	***	***	144	6172	N	629	Kgf	5821	N	593	Kgf	1
320	35			***	DA+	***	***	219	8093	N	825	Kgf	7568	N	771	Kgf	1
370	40			***	DA+	***	***	335	10860	N	1107	Kgf	10080	N	1028	Kgf	1
420	40			***	DA+	***	***	432	13994	N	1426	Kgf	13024	N	1328	Kgf	1
480	40			***	DA+	***	***	564	18278	N	1863	Kgf	17049	N	1738	Kgf	1
520	50			***	DA+	***	***	828	21613	N	2203	Kgf	19798	N	2018	Kgf	1
570	60			***	DA+	***	***	1194	26164	N	2667	Kgf	23548	N	2400	Kgf	1
620	60			***	DA+	***	***	1412	30956	N	3156	Kgf	27911	N	2845	Kgf	1
670	60			***	DA+	***	***	1649	36150	N	3685	Kgf	32641	N	3327	Kgf	1
720	70			***	DA+	***	***	2222	42058	N	4287	Kgf	37326	N	3805	Kgf	1
770	70			***	DA+	***	***	2541	48102	N	4903	Kgf	42744	N	4357	Kgf	1
820	70			***	DA+	***	***	2882	54552	N	5561	Kgf	48526	N	4947	Kgf	1
870	70			***	DA+	***	***	3244	61408	N	6260	Kgf	54672	N	5573	Kgf	1
920	80			***	DA+	***	***	4146	69177	N	7052	Kgf	60558	N	6173	Kgf	1
960	90			***	DA+	***	***	5079	75876	N	7735	Kgf	65298	N	6656	Kgf	1
1000	100			***	DA+	***	***	6123	82931	N	8454	Kgf	70160	N	7152	Kgf	1
1050	100			***	DA+	***	***	6751	91431	N	9320	Kgf	77430	N	7893	Kgf	1
1100	120			***	DA+	***	***	8891	101798	N	10377	Kgf	83265	N	8488	Kgf	1
1150	120			***	DA+	***	***	9717	111263	N	11342	Kgf	91109	N	9287	Kgf	1
1250	130			***	DA+	***	***	12437	132392	N	13496	Kgf	106714	N	10878	Kgf	1
1350	140			***	DA+	***	***	15623	155515	N	15853	Kgf	123387	N	12578	Kgf	1
1450	150			***	DA+	***	***	19310	180670	N	18417	Kgf	141090	N	14382	Kgf	1

Cylinder diameter in mm
Piston diameter in mm
Stroke length to be filled in mm
Minimum standard stroke = 75 mm
Add 1: DA = double acting, SRC = Spring return closed, SRO = Spring return open
Add 2: HD = hydraulic dampener, MO = manual override

ATLAS actuation™ is a by DAC Technologies by trademarked product



The above mentioned actuator models are an indication only, our linear actuators are designed, engineered and fabricated fully in accordance with customer demands in relation to required force and stroke length.

Output forces up to 2.000 kN for pneumatic actuators.

Output forces up to 20.000 kN for hydraulic actuators.

Spring forces up to 400 kN to open or to close position.



Other than the well known actuator manufactures that uses standard pipes and spring from their shelf, DAC designs each individual actuator in detail in order to select the exact dimension of the cylinder and the spring required.

This aspect results into a product that is made fit for purpose, avoiding an over-designed cylinder diameter supplied with a standard, but made for purpose, spring, saves 30 – 50% height of the actuator, and automatically results into considerable weight savings.

Our supply is not restricted to carbon steel, we are currently investigating stainless steel and Duplex materials, even Titanium might be a solution in case weight is the essential figure.

PISTON TYPE LINEAR ACTUATORS



Pneumatics:

- Control panels and modules.
- Modulating systems.
- ESD Systems.
- HIPPS Systems.
- Compressor systems.



Hydraulics:

- Power packs.
- Control panels and modules.
- Wellhead control systems
- Modulating systems.
- ESD Systems.
- HIPPS Systems.



Valve automation:

Our facilities counts all necessary tools, machines, lifting equipment (3x 5 tonnes), pressure - and hydro test facilities but also the most modern computer techniques are available to design, manufacture, built and test each individual product.

Therefore an excellent facility dedicated to fabricate skid mounted units, packs and systems of any kind.

Automate valves, such as ball, butterfly, gate and globe valves, double block and bleed valves and rising stem ball valves and others used into the oil, gas and petrochemical industry.



Applications:

- Standard service
- High temperature service
- Low temperature service
- Cryogenic service
- Subsea applications
- Bellow seal constructions



CONTACT - REFERENCES

Main customers and users:

Adma
AGIP
AGT
Apache energy
ARAMCO
ATC
Azzawiya
Bechtel
Bluewater Energy Services
BP – UK
BP Oman
Cameron
CMI-France
Cofely
Control Seal
CPOC
CTOC
Delta Hydrocarbon
Dow Chemicals
Dresser
Frames Group of Companies
Gaz de France
Gazprom
GS/IOEC/OIEC
Heerema
INPEX
IV Consult
Kerr Mc Gee
Lazaro Ituarte
Ludan
Lukoil
MODEC
Mokveld
NAM
NIOC/POGC/Petropars/TIJD JV
Noordgastransport
Northern Petroleum
OPET Turkey.
PDO
Petrobras
Petrocanada
Petrochina
Petrofac
PTT
SBM
Sempell
Shell Moerdijk
Shell UK
Sonatrach
Statoil
Technicas Reunidas
Total
TYCO
Valbart
Vermillion
Venture
Woodside
YUKAS



CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

DAC Technologies B.V.
Energieweg 44
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The Netherlands

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standard:

ISO 9001 : 2008

The Quality Management System is applicable to:

Design and Manufacturing of: actuators, control and positioning systems, pneumatic, hydraulic, gas-over-oil manual gear and sub-sea, double acting and spring return for linear or turning valves, chemical injection and process units and associated equipment for oil, gas and energy related industries, offshore and onshore. Consultancy, field service and spare parts supply.

Approval Certificate No: RQA661902	Original Approval	:	24 April 2007
	Current Certificate	:	24 April 2013
	Certificate Expiry	:	23 April 2016


Issued by: Lloyd's Register Nederland B.V.



This document is subject to the provision on the reverse
K.P. van der Mandelelaan 41a, 3062 MB Rotterdam, The Netherlands - KvK nr. 24247948
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.





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