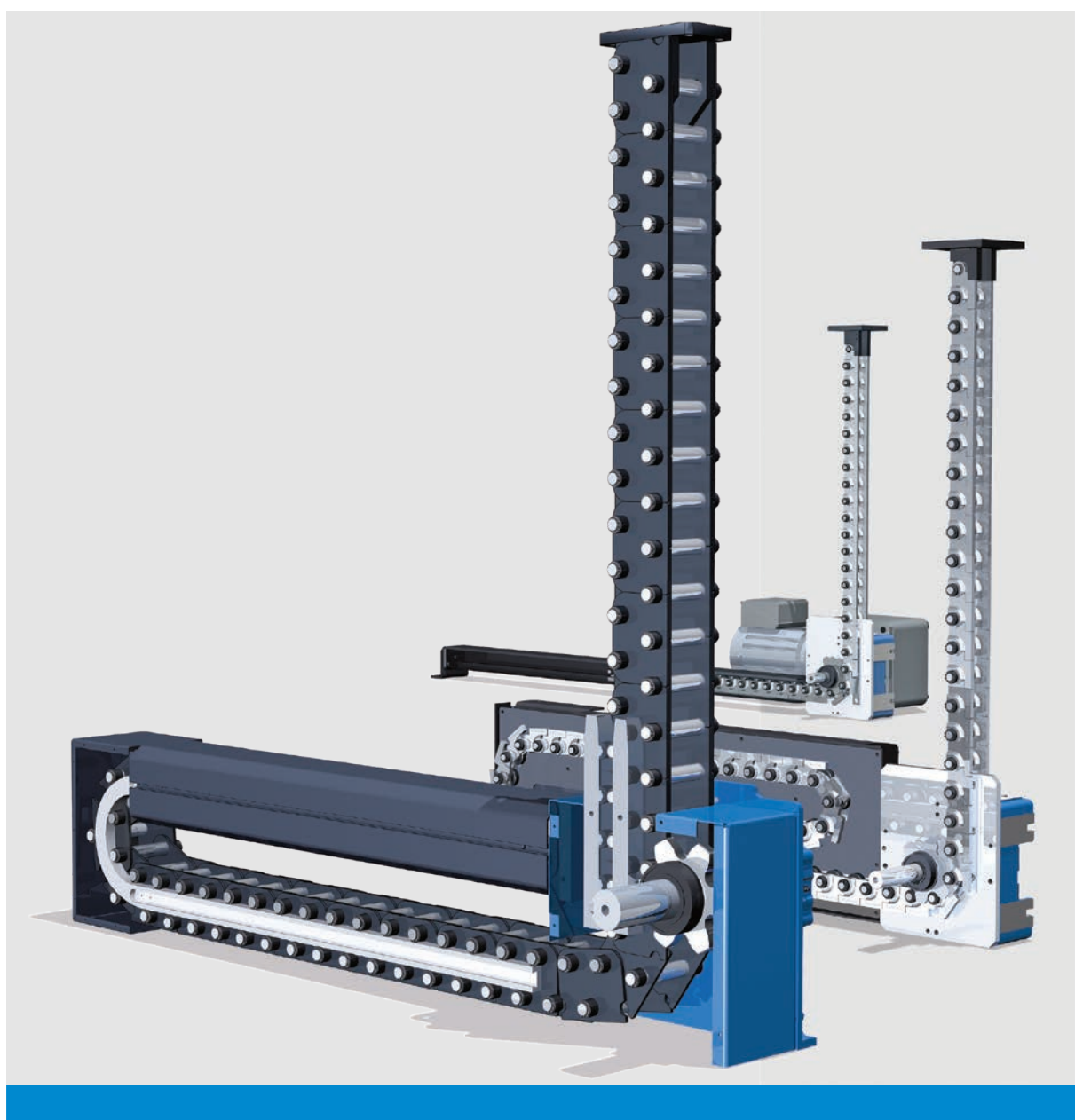# SERAPID
RIGID CHAIN TECHNOLOGY

LIFT SYSTEMS

Linear telescopic lifting columns

LINEAR TELESCOPIC LIFTING COLUMNS FOR INDUSTRIAL APPLICATIONS

For 45 years, SERAPID has been designing, manufacturing and distributing a wide range of telescopic and linear actuators. Its field of application is focused on the moving of loads, linear transfers and lifting systems, in all areas of industrial activity.

These telescopic actuators are designed on the simple mechanical principle of the Rigid Chain, which allows the transfer of loads from a few kilograms to several hundred tonnes. This technology is based on the locking and unlocking of connected, linked elements. When lifting a load, the specially shaped chain links interlock with each other, forming a rigid bar or column. When lowered, the links unlock, allowing it to bend to store into a compact package.

Whatever your challenge, our teams are at your service to offer you the precise solution adapted to your needs and to accompany you throughout your project.

Advantages of SERAPID's range

Our rigid-chain technology combines the strengths of other transfer methods, such as hydraulics, belts or spindle screws, and at the same time it eliminates their weaknesses:

- high speeds with permanent lubrication in oil bath (HD Lift version)
- a robust design allowing a long service life and the use in harsh environments: clean-room conditions, dust, temperature, humidity, radiation
- repeatable positioning in the millimetre range, even at high speed
- designed for low vibration and noise
- low maintenance
- ATEX certified, category II 2GD c T4
- maintains position with no drift
- specific applications on request: stainless steel, suitable surface treatment, specific heat treatment
- options and accessories : limit switch, encoder, protective bellow, interface, special hub, output shaft


LinkLift

ChainLift

HDLift
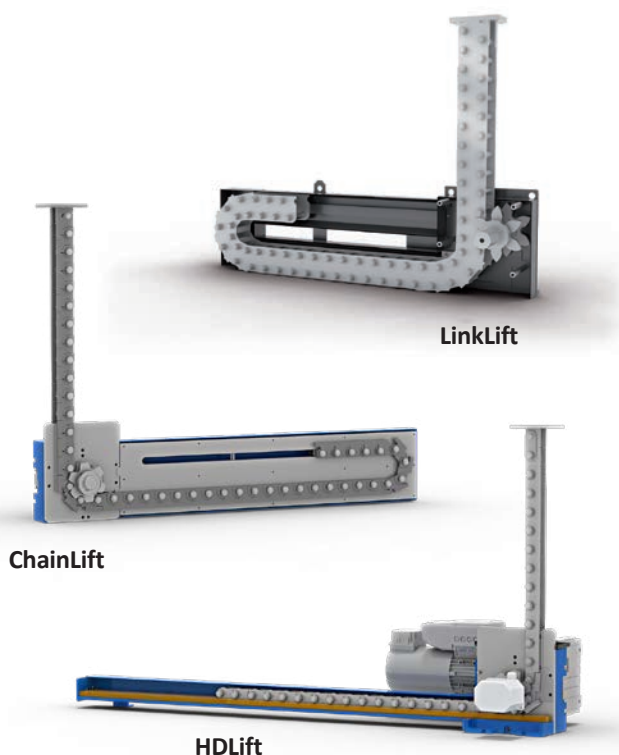
CHAINLIFT lifting chain

Proven reliability

The ChainLift is designed for applications with an average frequency of use, between 5 and 15 cycles per hour. It will be suitable, for example, for a workbench lift in automotive manufacturing. The nominal lifetime is **250,000 cycles**. Lubrication maintenance is required every 13,000 cycles in the first year and then every 50,000 cycles (or every year). For requirements outside of our specifications, please contact us.

ChainLift (standard model range)

	ChainLift 40	ChainLift 60
dyn / stat capacity (kN)	7,5	20
max. stroke (m)	1	2
max. speed (mm/s)	200	200
pitch of link (mm)	40	60
primitive radius (mm)	40	60
weight of chain (kg/m)*	7,8	15,3
weight of drive housing (kg)*	18,2	39,7
weight of double-return magazine (kg/m)*	11,7	17,2
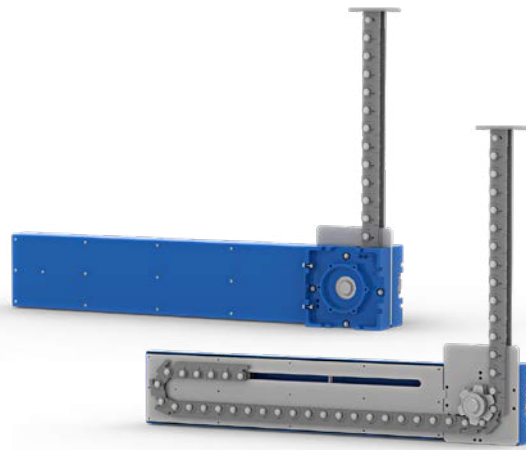
Lifting system for automotive industry: ChainLift with bellow cover

*approximate weight

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
ChainLift 40	60	101	140	10	202	255	168	59	25	110	5	M10	20	M8	130	R40	49	70	70	100	100	10	198
ChainLift 60	70	136	170	14	272	350	200	95	45	150	6	M16	32	M10	170	R60	70	90	90	130	130	11	271

All dimensions in mm.

| Standard magazine, length (Y) :			
Max. stroke	500	1 000	2 000
ChainLift 40, Y =	396	646	/
ChainLift 60, Y =	-	688,5	1 188.5

![SERAPID - RIGID CHAIN TECHNOLOGY]
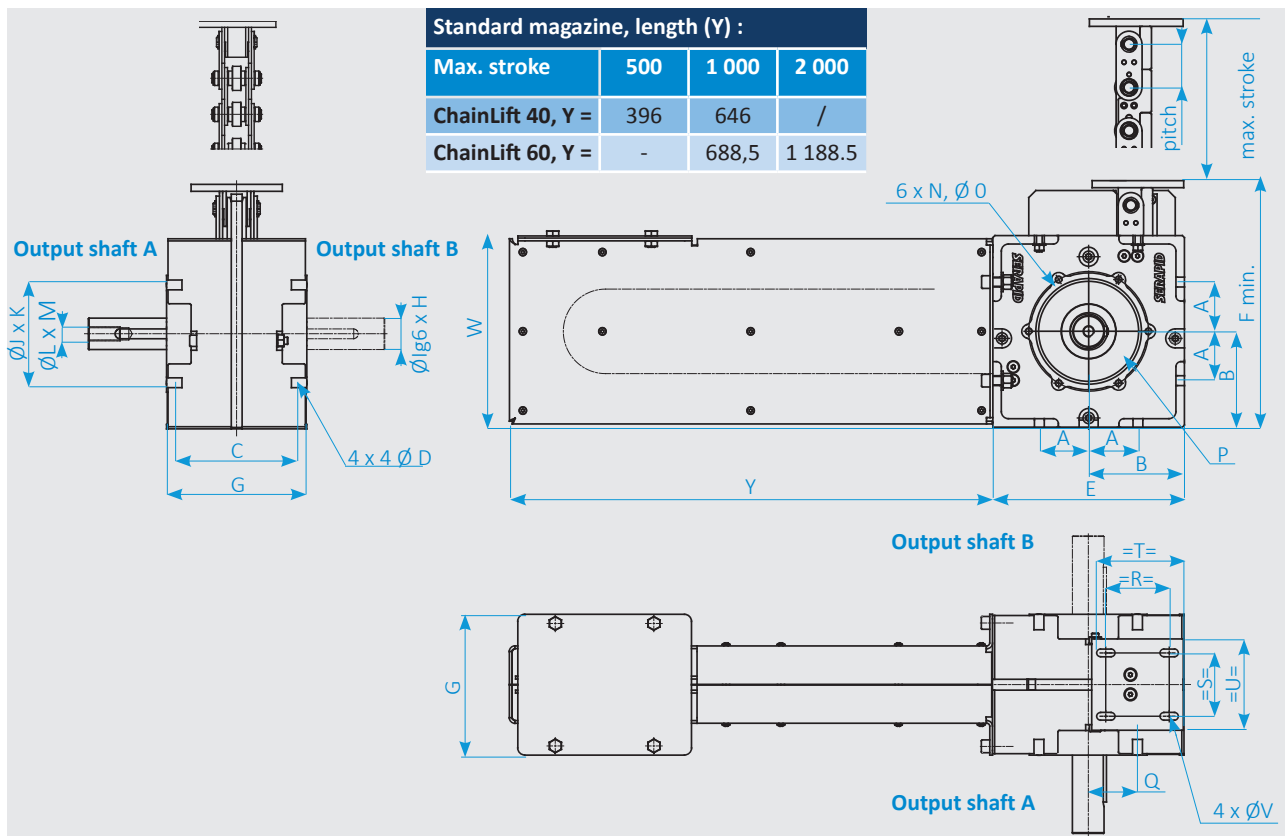
HD LIFT lifting chain

Strength and endurance

The systems in our Heavy-Duty line are designed for high operating cycles (> 15 cycles / hour). The guaranteed minimum lifetime is **one million cycles** under maximum load. The HD Lift is a sealed system and includes a splash lubrication system, with oil-proof drive housing and chain magazine. For maintenance, just an oil change once in a year. Bellows covers are available.

The product range includes five standard systems, covering dynamic loads up to 50 kN and strokes up to 2.5 m. For requirements outside of our specifications, please contact us.

Oil bath
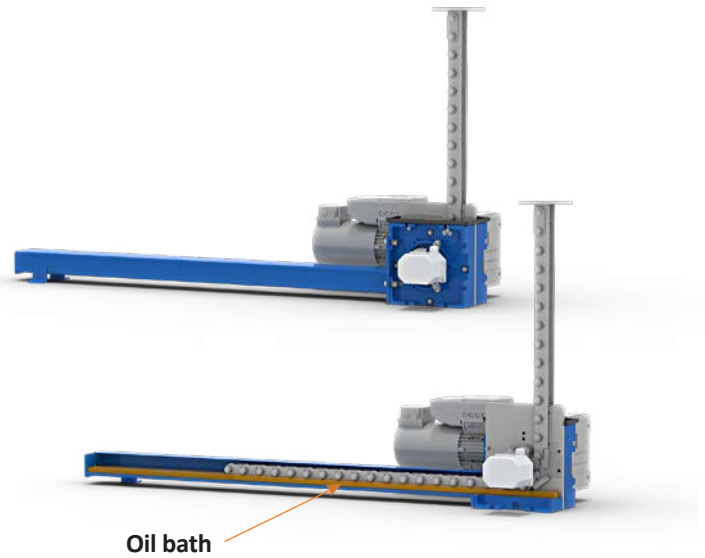
HDLift (standard model range)

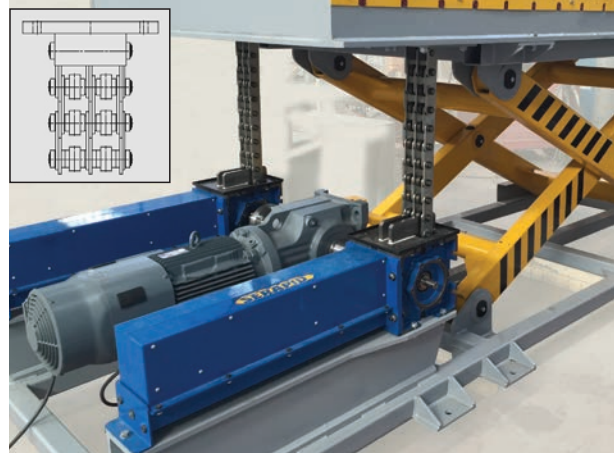|	HD Lift 40	HD Lift 60S	HD Lift 60D	HD Lift 90S	HD Lift 90D
dyn / stat capacity (kN)	6,5	12,5	19	40	50
max. stroke (m)	1	1,5	1,5	2	2,5
max. speed (mm/s)*	300	300	300	300	300
pitch of link (mm)	40	60	60	90	90
primitive radius (mm)	40	60	60	90	90
weight of chain (kg/m)**	7,8	11,7	18,3	34,5	55,5
weight of drive housing (kg)**	18,2	39,2	54	120	160
weight of single-return magazine (kg/m)*	13	17,5	25	48	57

* possibility to increase the speed to 500 mm/s maximum on request
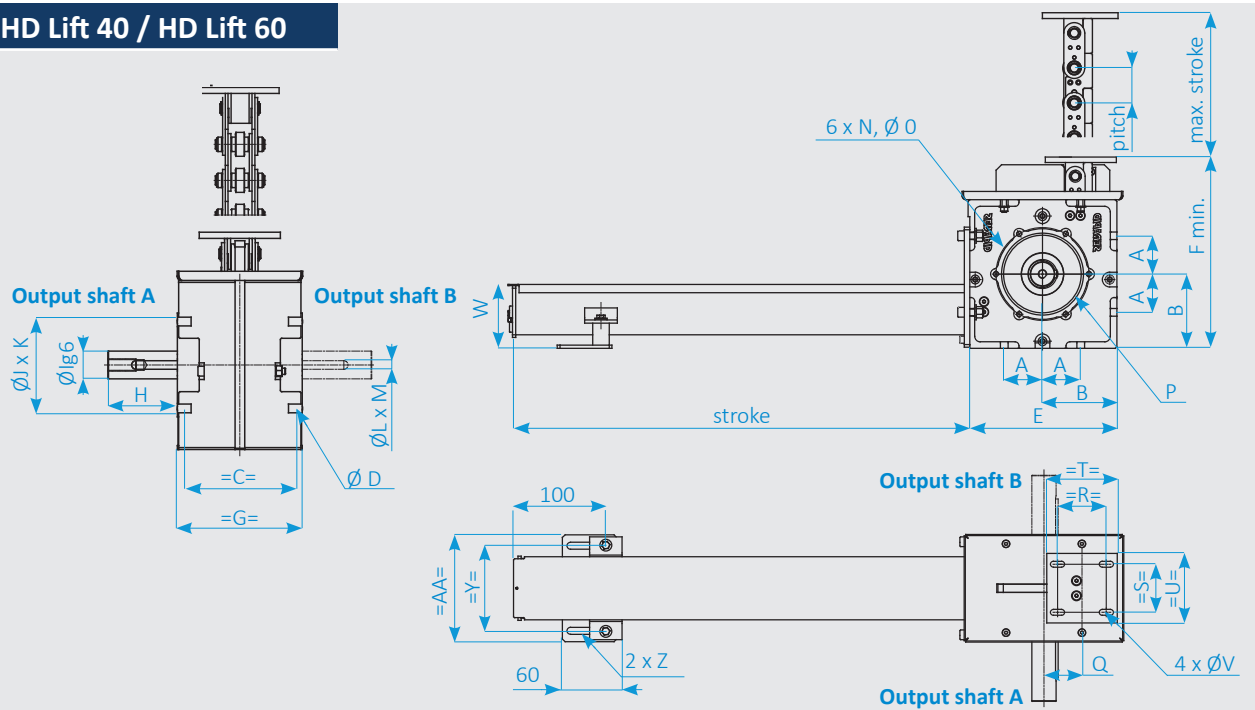
** approximate weight

**Lifting platform for automotive industry :
HD Lift 60S lifting chain.**

HD LIFT Duplex chain

The models HD Lift 60D and 90D use our duplex-type chain, which features 3 rows of links, 2 rows of central rollers, and provides a higher load capacity.

HD Lift 40 / HD Lift 60

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y	Z	AA
HD Lift 40	60	101	140	10	199	255	168	59	25	110	5	M10	20	M8	130	R40	49	70	70	100	100	10	80	127	13x48	170
HD Lift 60S	70	136	170	14	269	350	200	95	45	150	6	M16	32	M10	170	R60	70	90	90	130	130	11	117	159	13x48	200
HD Lift 60D	70	136	220	14	269	350	246	72,5	60	150	6	M20	39	M10	170	R60	78,5	170	2x120	220	320	18	117	191	13x48	224

HD Lift 90S / HD Lift 90D
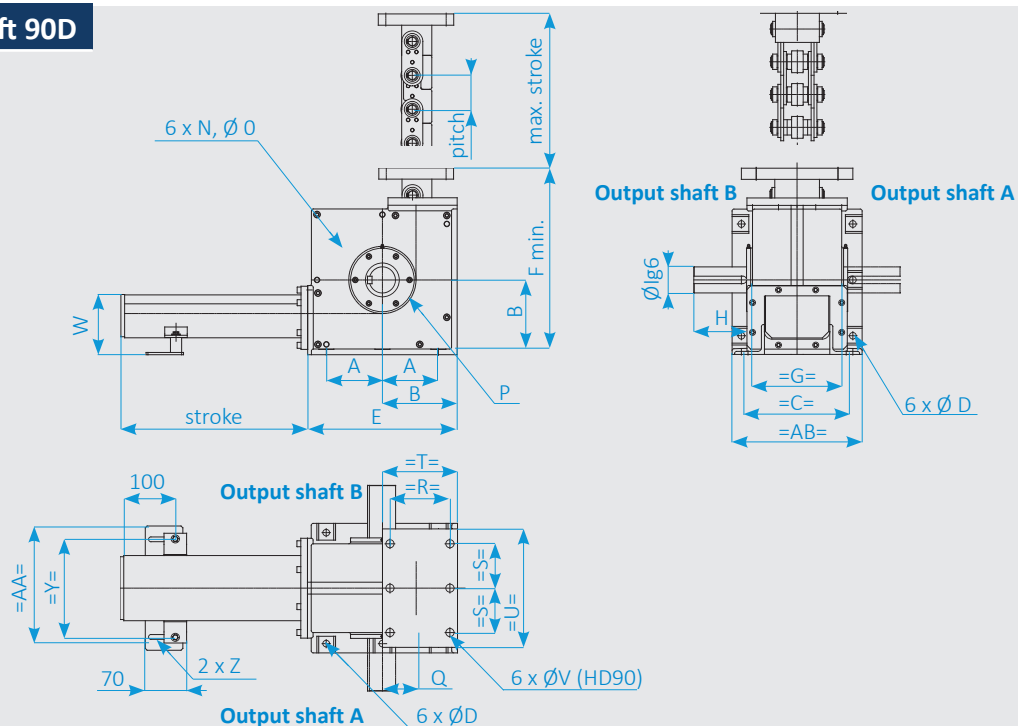
Model	A	B	C	D	E	F	G	H	I	L	M	P	Q	R	S	T	U	V	W	Y	Z	AA	AB
HD Lift 90S	150	200	300	18	400	500	272	142	70	M20	39	R90	110	180	120	220	320	18	162	264	13x48	320	350
HD Lift 90D	150	200	388	18	400	500	360	162	100	M24	48	R90	110	180	160	220	450	22	162	344	13x48	400	438

All dimensions in mm.

Dynamic capacity CHAINLIFT / HD LIFT
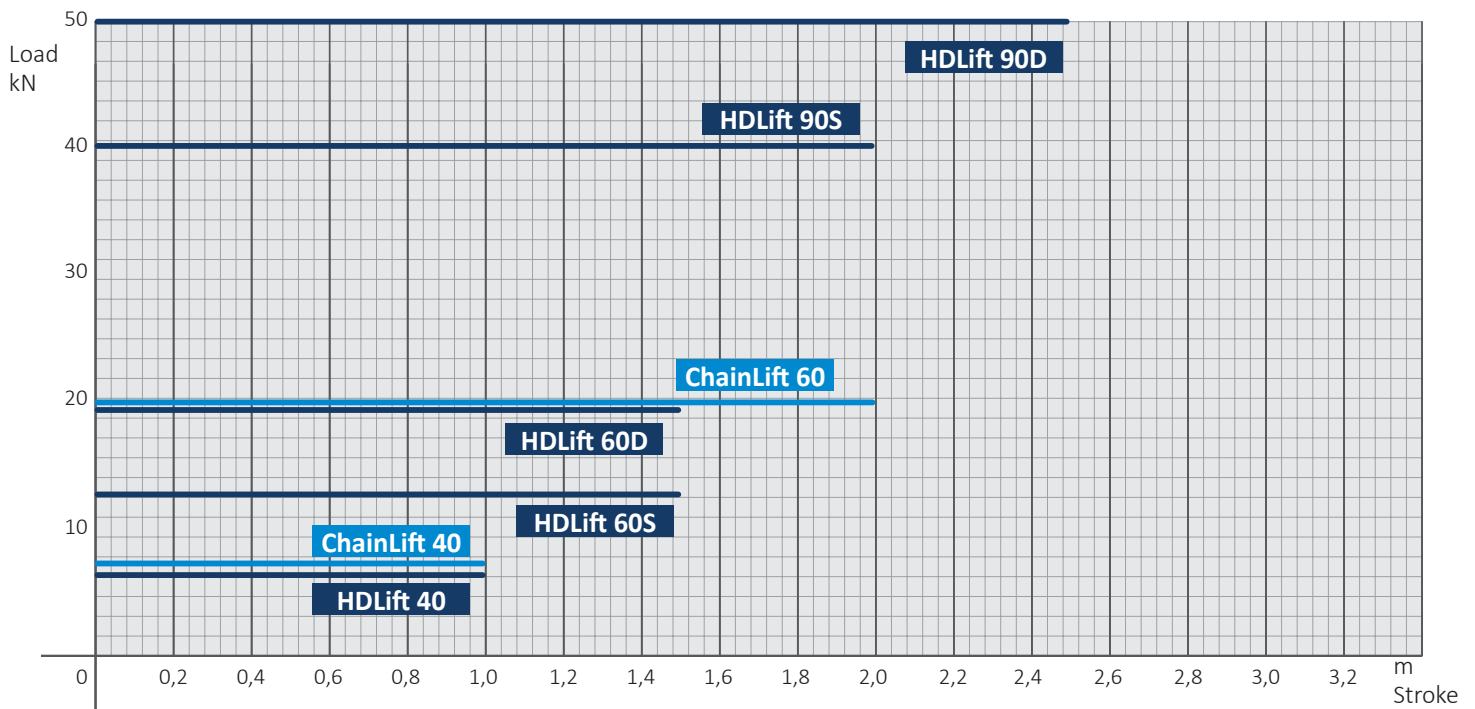
Motorisation

The following basic formulae are used to calculate the torque, speed and power required.

The maximum torque (M) per column is calculated from the total static (Fs) or dynamic load (Fd), whichever is the higher. This value is divided by the number of columns.

The weight of the chain is then added. Friction forces occurring in the guides are insignificant. Forces of inertia must be added if the system does not include a speed variation control.

$$Fs = \frac{S \times Fu_s + Ps}{Nc} \ [N]$$

$$Fd = \frac{S \times Fu_d + Ps}{Nc} \ [N]$$

$$Pc = Ct \times m \ [N]$$

$$M = \frac{(max(Fs;Fd) + Pc) \times p \times 10^{-3}}{\eta} \ [Nm]$$

The rotation speed of the drive shaft (N) is calculated from the chain pitch (p) and the lifting speed (V).

We generally recommend a frequency converter to minimise shock; other-wise, the speed must not exceed 30 mm/s.

$$N = \frac{V}{2\pi \times p \times 10^{-3}} \ [U/min]$$

The output power (P) required per column is calculated from the torque (M) and the shaft rotation speed (N):

$$P = \frac{M \times N \times \pi \times 10^{-3}}{30} \ [kW]$$

Fs : total static load [N]	Ct : total stroke [m]
Fd : total dynamic load [N]	m : mass of chain [N/m]
S : platform area [m²]	M : maximum torque [Nm]
Fu_s : static payload [N/m²]	p : chain pitch [mm]
Fu_d : dynamic payload [N/m²]	η : system efficiency (= 0,8)
Ps : weight of platform [N]	N : shaft rotation speed [tr/min]
Nc : number of lifting columns	V : lifting speed [m/min]
Pc : weight of chain [N]	P : output power [kW]

TRANSFER SOLUTIONS

Harsh environment? Need a long stroke and have limited installation space? Rigid Chain Technology is the solution.

SERAPID offers with its Rigid Chain products a compact, telescopic, easy-to-install and environmentally friendly transfer solution.

SERAPID linear actuators bring reliability and high operation capability to your material handling and production processes, along with low maintenance needs and increased safety at work.

Our applications integrate into **SMED solutions** (Single Minute Exchange of Die) as well as **Lean Manufacturing solutions**.

RollBeam vertical configuration

Rigibelt

LinearBeam

They trust us:

AIRBUS

Alcatel·Lucent

autoneum

BOEING

BOUYGUES

Cegelec

CITROËN

CYRIL BATH
An Aries Alliance Company

eDF

GE

Gestamp

LATESYS

MAXION WHEELS

MICHELIN

NAVAL GROUP

PEUGEOT

PEI
Pinette Emidecau Industries

orano

reel

RENAULT

SAFRAN

SIEMENS

thyssenkrupp

SERAPID
RIGID CHAIN TECHNOLOGY
www.serapid.com

SERAPID France - Head Office
ZI Louis Delaporte, Zone Bleue, Voie F
F-76370 Rouxmesnil-Bouteilles | France
+33 (0)2 32 06 35 60
info-fr@serapid.com

SERAPID Ltd
Elm Farm Park, Great Green, Thurston,
Bury St Edmunds | IP31 3SH England
+44 (0)1359 233335
info-uk@serapid.com

SERAPID Deutschland GmbH
Wilhelm-Frank-Straße 30
D-97980 Bad Mergentheim | Germany
+49 (0)7931 9647-0
info-de@serapid.com

SERAPID USA INC.
34100 Mound Road
Sterling Heights MI 48310 | USA
+1 586 274 0774
info-us@serapid.com

SERAPID Singapore Pte Ltd
1 George Street #10-01
Singapore 049145 | Singapore
+65 9119 5890
info-sg@serapid.com

SERAPID Italy Office | +39 01 18 00 35 44 | info-it@serapid.com
SERAPID Mexico Office / LATAM | +52 1 442 4 900 701 | info-mx@serapid.com

SERAPID China Office | +86 185 1215 0303 | info-cn@serapid.com
SERAPID Brazil Office | +55 11 9 73 85 78 37 | info-br@serapid.com