

PHOENIX
Telescopic lifting column

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Application examples



1.1 Company photo: Bellazzo Kaffeebar

Lifting the cover lid of a mobile coffee bar by about 800 mm using a manually adjustable PHOENIX telescope lifting column with a removable hand crank.



1.2 Company photo: Ingenia, Böblingen

PH56 Standard lifting system for ergonomic height adjustment of a shelf in an assembly line.

Design of the lifting system according to Schematic view 2.2. Simple operation is ensured through the use of a contactor control system "H1TM", with electrical overload protection. The total weight of 1100 kg is moved at a speed of 2.4 m/min. Two inductive limit switches ensure a safe lift limitation



1.3 Company photo: Carl Zeiss, Jena

Low vibration actuator with a high level of precision for star projections in planetariums.

This single lifting column has been adjusted to meet the required operating conditions in a planetarium. Movement which is silent and almost without vibration is ensured through the use of a servo motor in connection with a belt drive.

In order to achieve an inconspicuous appearance, all external profiles of the lifting column have been furnished with a special coating

Project planning

2.1 Standard equipment

- Short safety nut in the single stage version with trapezoidal screw
- Fulfills the safety regulation EN 1494)
- Inductive limit switch to determine the upper and lower end position, see page18 (only for single stage lifting columns)
- Gear limit switch to determine upper and lower end position, see page18 (suitable for single stage and multi stage lifting columns)



2.2 Performance characteristics

- High compression and tensile forces up to 25 kN
- Enclosed, low maintenance design
- Variable modular construction system
- Admissible off center load pick up
- Self-locking mechanism with single start trapezoidal screw
- Lifting speeds from 5 to 200 mm/s with the two start trapezoidal or ball screw
- Duty ratio 20%/h or 15%/10min

*) Vibrations, optimal sliding conditions can influence the self-locking mechanism!

We recommend the use of a braking motor

2.3 Optional possibilities

- Encoder
- Special head resp. foot plate
- Motor connection, Motor flange
- Ball screw
- Multi start screw
- Customer specific requirements

2.4 Guidelines for use

Protection from dirt

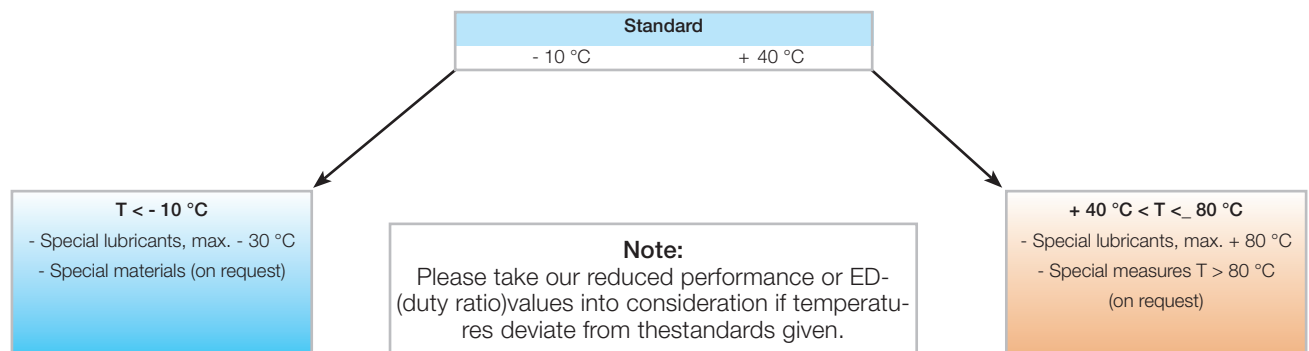
- Closed outer housing through section tubes
- Rubber seals between the individual stages

Lubrication

- Regular lubrication carried out according to maintenance plan (included in scope of delivery)
- Standard lubrication grease

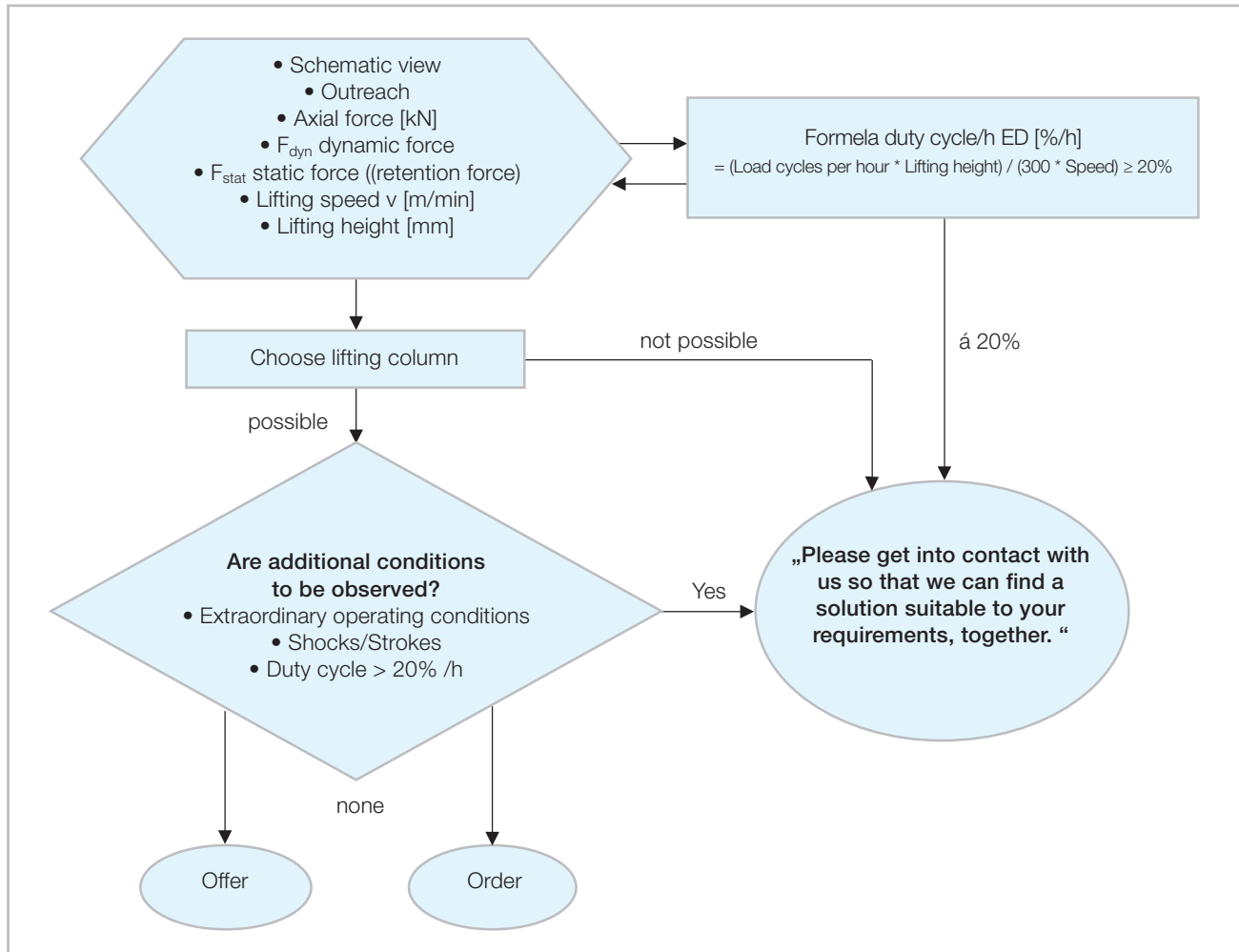


2.5 Ambient temperatures

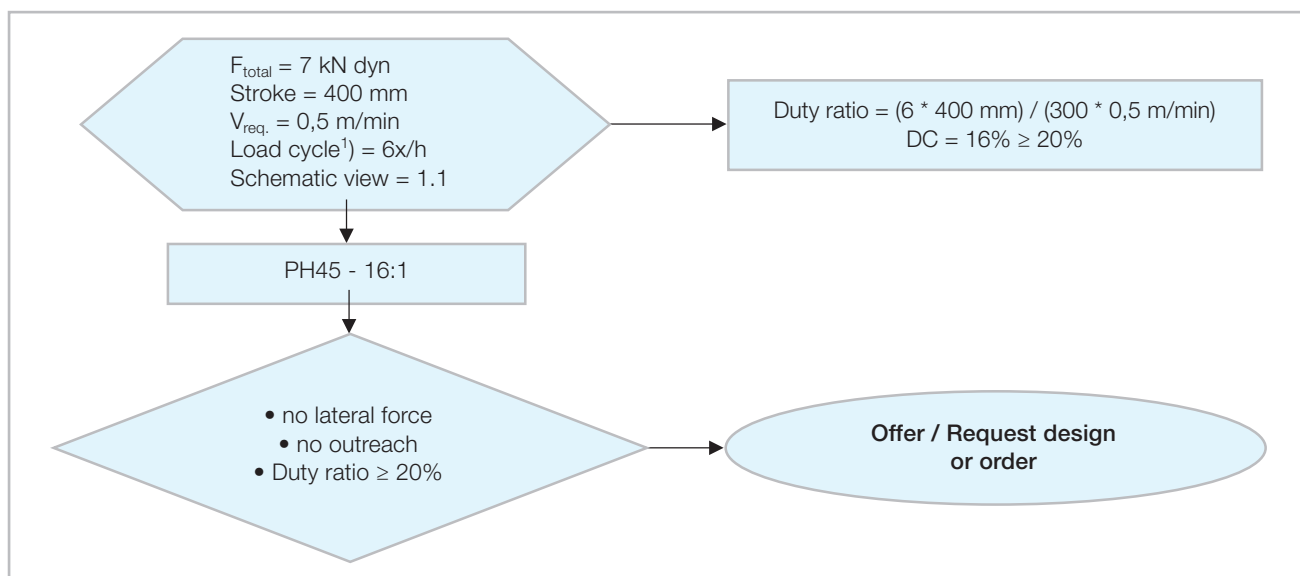


Project planning

2.6 Flow diagramm



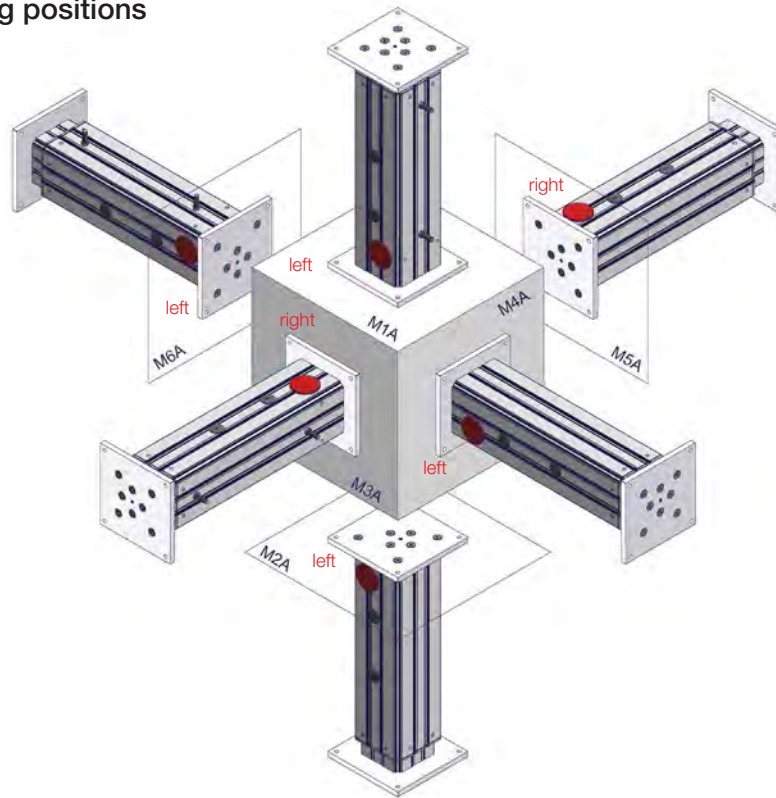
2.7 Example dimensioning flow diagram



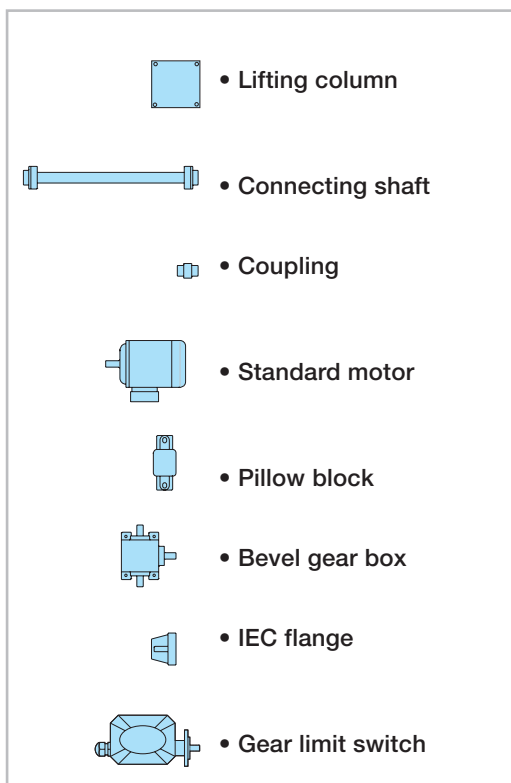
1) Load cycle = 2 strokes

2.8 Mounting positions

2.8.1 Mounting positions



2.8.2 Symbol key



PHOENIX telescopic lifting columns can be used as either single drive units multi-screw lifting systems.

Multi-screw lifting systems with mechanical synchronization are driven by a single motor, which makes them impervious to unequal load distribution and its negative effects on the synchronization of the screw jacks.

Multi-screw lifting systems with electrical synchronization are distinguished by their low requirements in terms of mechanical connecting elements (and therefore lack of running noise), but they do require more sophisticated controls.

Precise configuration of the drive motors, in conjunction with a master-slave layout, produces the corresponding exact synchronization of the drive systems.

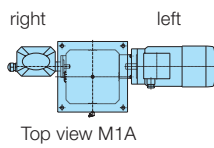
Precise configuration of the drive motors, in conjunction with a master-slave layout, produces the corresponding exact synchronization of the drive systems.

Project planning

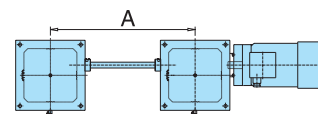
2.9 Schematic drive system layout

2.9.1 Lifting column, mechanically synchronised

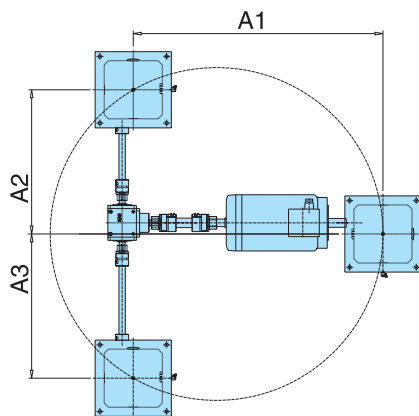
Schematic view 1.1



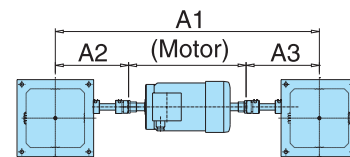
Schematic view 2.1



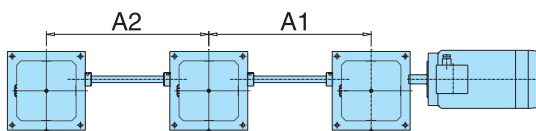
Schematic view 3.1



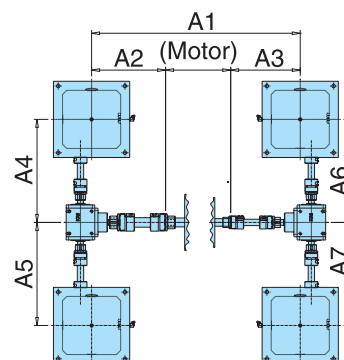
Schematic view 2.2



Schematic view 3.2



Schematic view 4.1

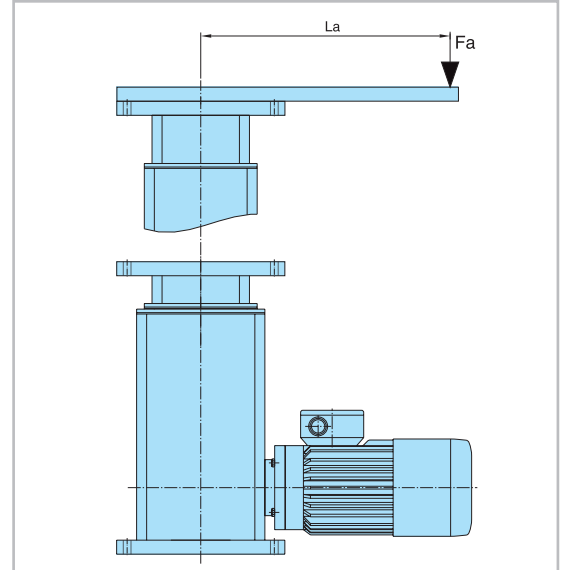
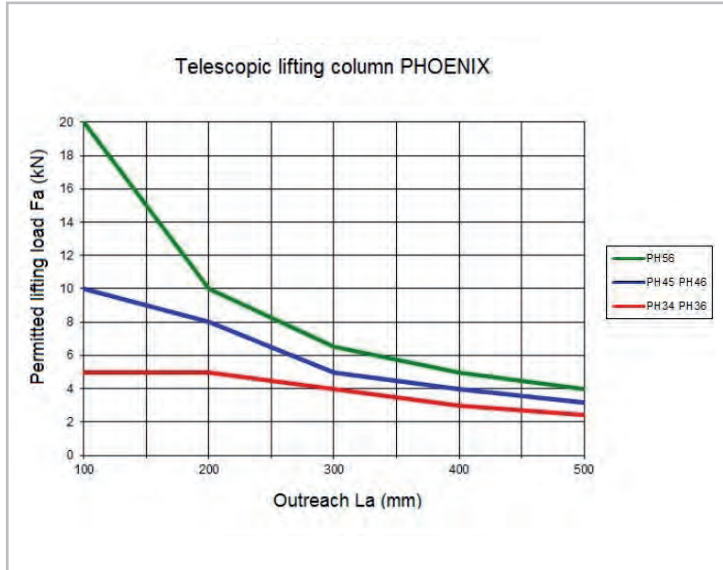


Technical informations

3.1 Table of settings

PHOENIX Size		Single stage			Multi stage	
		PH34	PH45	PH56	PH46	PH36
Number of levels		1	1	1	2	3
Max. lifting and tensile load	kN	5	10	25	10	8
Max. permitted drive capacity at t=20°C duty type S3 20% - 60min	kW	0,2	0,5	0,5	0,5	0,5
Max. permitted drive capacity bei t=20°C duty type S3 10% - 60min	kW	0,42	1,1	1,1	1,1	1,1
Ratio N		4:1	4:1	6:1	6:1	6:1
Ratio L		16:1	16:1	24:1	24:1	24:1
Max. permitted input speed	1/min	1500	1500	1500	1500	1500
Max. perm. torque on the input shaft	Nm	3,4	7,1	18	18	18
Screw 1. stage - diameter x pitch		24x5	30x6	36x6	30x32	30x32
Screw pitch 2nd stage	mm	-	-	-	32	32
Screw pitch 3rd stage	mm	-	-	-	32	32

3.2 Off center loads



Technical informations

3.3 Performance tables

PHOENIX PH34 / PH34L screw Tr 24 x 5

n [1/min]	Lifting speed [m/min.]		F=5 [kN]				F=4 [kN]				F=3 [kN]				F=2,5 [kN]				F=2 [kN]				F=1,5 [kN]				F=1 [kN]			
			N	L	Nm	kW	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L
1500	1,88	0,47	3,5	0,5	1,1	0,2	3,0	0,4	1,0	0,1	2,0	0,3	1,0	0,1	2,0	0,3	1,0	0,1	1,0	0,2	0,5	0,1	1,0	0,2	0,3	0,1	1,0	0,1	0,2	0,1
1000	1,25	0,31	3,5	0,4	1,1	0,1	3,0	0,3	1,0	0,1	2,0	0,2	1,0	0,1	2,0	0,2	1,0	0,1	1,0	0,1	0,5	0,1	1,0	0,1	0,3	0,1	1,0	0,1	0,2	0,1
750	0,94	0,23	3,5	0,3	1,1	0,1	3,0	0,2	1,0	0,1	2,0	0,2	1,0	0,1	2,0	0,1	1,0	0,1	1,0	0,1	0,5	0,1	1,0	0,1	0,3	0,1	1,0	0,1	0,2	0,1
600	0,75	0,19	3,5	0,2	1,1	0,1	3,0	0,2	1,0	0,1	2,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	1,0	0,1	0,5	0,1	1,0	0,1	0,3	0,1	1,0	0,1	0,2	0,1
500	0,63	0,16	3,5	0,2	1,1	0,1	3,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	1,0	0,1	0,5	0,1	1,0	0,1	0,3	0,1	1,0	0,1	0,2	0,1
300	0,38	0,09	3,5	0,1	1,1	0,1	3,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	1,0	0,1	0,5	0,1	1,0	0,1	0,3	0,1	1,0	0,1	0,2	0,1
100	0,13	0,03	3,5	0,1	1,1	0,1	3,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	1,0	0,1	0,5	0,1	1,0	0,1	0,3	0,1	1,0	0,1	0,2	0,1
50	0,06	0,02	3,5	0,1	1,1	0,1	3,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	2,0	0,1	1,0	0,1	1,0	0,1	0,5	0,1	1,0	0,1	0,3	0,1	1,0	0,1	0,2	0,1

PHOENIX PH36 / PH36L

n [1/min]	Lifting speed [m/min.]		F=8 [kN]				F=7 [kN]				F=6 [kN]				F=5 [kN]				F=4 [kN]				F=2 [kN]				F=1 [kN]			
			N	L	Nm	kW	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L
1500	8,00	2,00	18,5	2,9	6,7	1,1	16,0	2,5	6,0	0,9	14,0	2,2	5,0	0,8	12,0	1,8	4,0	0,7	9,0	1,5	3,3	0,5	5,0	0,7	1,7	0,3	2,0	0,4	0,8	0,1
1000	5,33	1,33	18,5	1,9	6,7	0,7	16,0	1,7	6,0	0,6	14,0	1,5	5,0	0,5	12,0	1,2	4,0	0,4	9,0	1,0	3,3	0,4	5,0	0,5	1,7	0,2	2,0	0,2	0,8	0,1
750	4,00	1,00	18,5	1,5	6,7	0,5	16,0	1,3	6,0	0,5	14,0	1,1	5,0	0,4	12,0	0,9	4,0	0,3	9,0	0,7	3,3	0,3	5,0	0,4	1,7	0,1	2,0	0,2	0,8	0,1
600	3,20	0,80	18,5	1,2	6,7	0,4	16,0	1,0	6,0	0,4	14,0	0,9	5,0	0,3	12,0	0,7	4,0	0,3	9,0	0,6	3,3	0,2	5,0	0,3	1,7	0,1	2,0	0,1	0,8	0,1
500	2,67	0,67	18,5	1,0	6,7	0,4	16,0	0,8	6,0	0,3	14,0	0,7	5,0	0,3	12,0	0,6	4,0	0,2	9,0	0,5	3,3	0,2	5,0	0,2	1,7	0,1	2,0	0,1	0,8	0,1
300	1,60	0,40	18,5	0,6	6,7	0,2	16,0	0,5	6,0	0,2	14,0	0,4	5,0	0,2	12,0	0,4	4,0	0,1	9,0	0,3	3,3	0,1	5,0	0,1	1,7	0,1	2,0	0,1	0,8	0,1
100	0,53	0,13	18,5	0,2	6,7	0,1	16,0	0,2	6,0	0,1	14,0	0,1	5,0	0,1	12,0	0,1	4,0	0,1	9,0	0,1	3,3	0,1	5,0	0,1	1,7	0,1	2,0	0,1	0,8	0,1
50	0,27	0,07	18,5	0,1	6,7	0,1	16,0	0,1	6,0	0,1	14,0	0,1	5,0	0,1	12,0	0,1	4,0	0,1	9,0	0,1	3,3	0,1	5,0	0,1	1,7	0,1	2,0	0,1	0,8	0,1

PHOENIX PH45 / PH45L screw Tr 30 x 6

n [1/min]	Lifting speed [m/min.]		F=10 [kN]				F=8 [kN]				F=6 [kN]				F=4 [kN]				F=3 [kN]				F=2 [kN]				F=1 [kN]			
			N	L	Nm	kW	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L
1500	2,25	0,56	8,5	1,3	2,8	0,4	7,0	1,1	2,0	0,4	5,0	0,8	2,0	0,3	3,0	0,5	1,0	0,2	3,0	0,4	0,9	0,1	2,0	0,3	0,6	0,1	1,0	0,1	0,3	0,1
1000	1,50	0,38	8,5	0,9	2,8	0,3	7,0	0,7	2,0	0,2	5,0	0,5	2,0	0,2	3,0	0,4	1,0	0,1	3,0	0,3	0,9	0,1	2,0	0,2	0,6	0,1	1,0	0,1	0,3	0,1
750	1,13	0,28	8,5	0,7	2,8	0,2	7,0	0,5	2,0	0,2	5,0	0,4	2,0	0,1	3,0	0,3	1,0	0,1	3,0	0,2	0,9	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,3	0,1
600	0,90	0,23	8,5	0,5	2,8	0,2	7,0	0,4	2,0	0,1	5,0	0,3	2,0	0,1	3,0	0,2	1,0	0,1	3,0	0,2	0,9	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,3	0,1
500	0,75	0,19	8,5	0,4	2,8	0,1	7,0	0,4	2,0	0,1	5,0	0,3	2,0	0,1	3,0	0,2	1,0	0,1	3,0	0,1	0,9	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,3	0,1
300	0,45	0,11	8,5	0,3	2,8	0,1	7,0	0,2	2,0	0,1	5,0	0,2	2,0	0,1	3,0	0,1	1,0	0,1	3,0	0,1	0,9	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,3	0,1
100	0,15	0,04	8,5	0,1	2,8	0,1	7,0	0,1	2,0	0,1	5,0	0,1	2,0	0,1	3,0	0,1	1,0	0,1	3,0	0,1	0,9	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,3	0,1
50	0,08	0,02	8,5	0,1	2,8	0,1	7,0	0,1	2,0	0,1	5,0	0,1	2,0	0,1	3,0	0,1	1,0	0,1	3,0	0,1	0,9	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,3	0,1

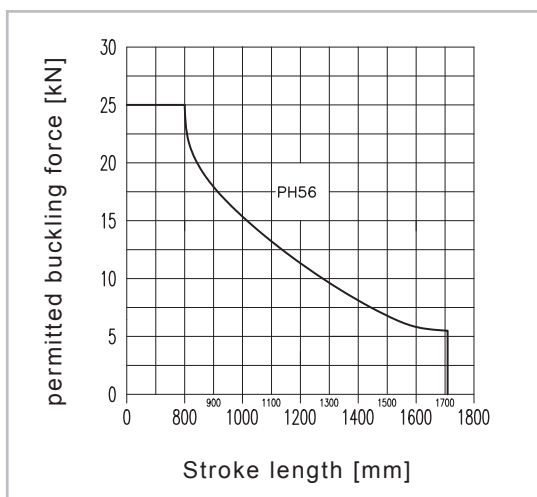
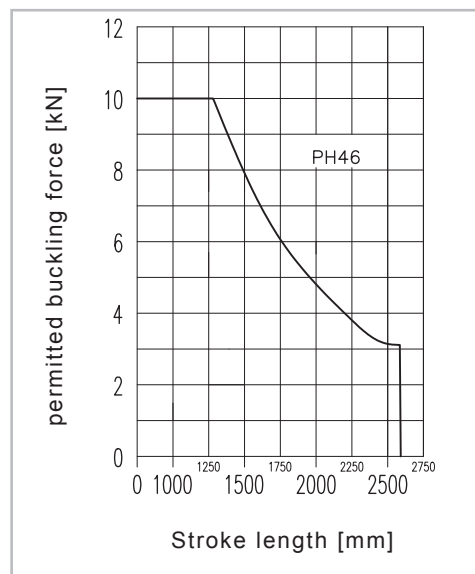
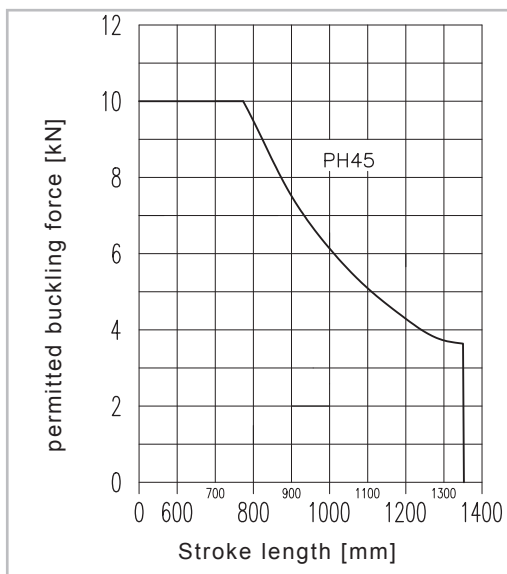
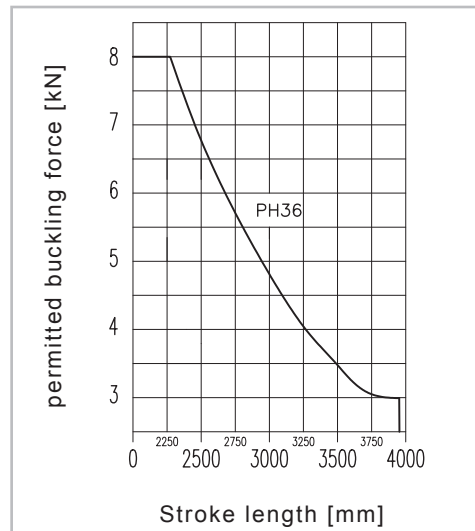
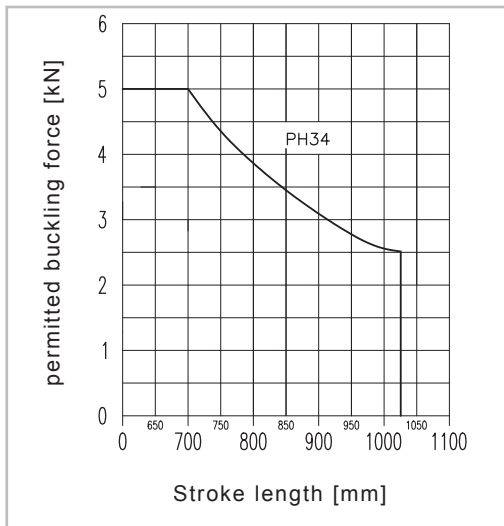
PHOENIX PH46 / PH46L

n [1/min]	Lifting speed [m/min.]		F=10 [kN]				F=8 [kN]				F=6 [kN]				F=4 [kN]				F=3 [kN]				F=2 [kN]				F=1 [kN]			
			N	L	Nm	kW	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L
1500	8,00	2,00	20,0	3,1	8,0	1,2	16,0	2,5	6,0	0,9	12,0	1,9	5,0	0,7	8,0	1,2	3,0	0,5	6,0	0,9	2,3	0,4	4,0	0,6	1,5	0,2	2,0	0,3	0,8	0,1
1000	5,33	1,33	20,0	2,1	8,0	0,8	16,0	1,7	6,0	0,6	12,0	1,2	5,0	0,5	8,0	0,8	3,0	0,3	6,0	0,6	2,3	0,2	4,0	0,4	1,5	0,2	2,0	0,2	0,8	0,1
750	4,00	1,00	20,0	1,6	8,0	0,6	16,0	1,2	6,0	0,5	12,0	0,9	5,0	0,4	8,0	0,6	3,0	0,2	6,0	0,5	2,3	0,2	4,0	0,3	1,5	0,1	2,0	0,2	0,8	0,1
600	3,20	0,80	20,0	1,2	8,0	0,5	16,0	1,0	6,0	0,4	12,0	0,7	5,0	0,3	8,0	0,5	3,0	0,2	6,0	0,4	2,3	0,1	4,0	0,2	1,5	0,1	2,0	0,1	0,8	0,1
500	2,67	0,67	20,0	1,0	8,0	0,4	16,0	0,8	6,0	0,3	12,0	0,6	5,0	0,2	8,0	0,4	3,0	0,2	6,0	0,3	2,3	0,1	4,0	0,2	1,5	0,1	2,0	0,1	0,8	0,1
300	1,60	0,40	20,0	0,6	8,0	0,2	16,0	0,5	6,0	0,2	12,0	0,4	5,0	0,1	8,0	0,2	3,0	0,1	6,0	0,2	2,3	0,1	4,0	0,1	1,5	0,1	2,0	0,1	0,8	0,1
100	0,53	0,13	20,0	0,2	8,0	0,1	16,0	0,2	6,0	0,1	12,0	0,1	5,0	0,1	8,0	0,1	3,0	0,1	6,0	0,1	2,3	0,1	4,0	0,1	1,5	0,1	2,0	0,1	0,8	0,1
50	0,27	0,07	20,0	0,1	8,0	0,1	16,0	0,1	6,0	0,1	12,0	0,1	5,0	0,1	8,0	0,1	3,0	0,1	6,0	0,1	2,3	0,1	4,0	0,1	1,5	0,1	2,0	0,1	0,8	0,1

PHOENIX PH56 / PH56L screw Tr 36 x 6

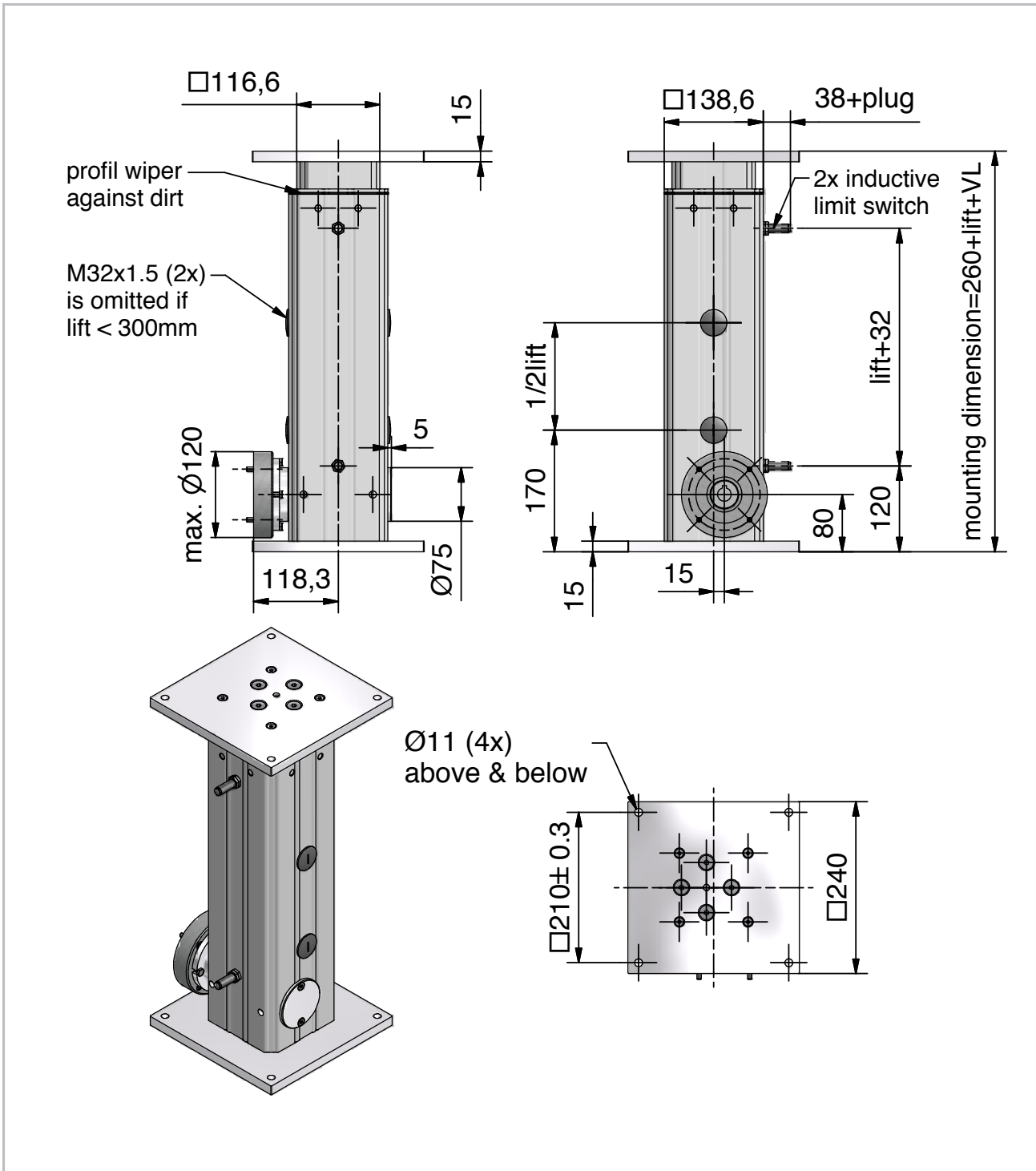
n [1/min]	Lifting speed [m/min.]		F=25 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]				F=1 [kN]			
			N	L	Nm	kW	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L	Nm	kW	N	L
1500	1,50	0,38	17,0	2,6	6,0	0,9	13,0	2,1	5,0	0,7	10,0	1,6	4,0	0,6	7,0	1,0	2,0	0,4	3,0	0,5	1,2	0,2	2,0	0,3	0,6	0,1	1,0	0,1	0,2	0,1
1000	1,00	0,25	17,0	1,7	6,0	0,6	13,0	1,4	5,0	0,5	10,0	1,0	4,0	0,4	7,0	0,7	2,0	0,2	3,0	0,3	1,2	0,1	2,0	0,2	0,6	0,1	1,0	0,1	0,2	0,1
750	0,75	0,19	17,0	1,3	6,0	0,5	13,0	1,0	5,0	0,4	10,0	0,8	4,0	0,3	7,0	0,5	2,0	0,2	3,0	0,3	1,2	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,2	0,1
600	0,60	0,15	17,0	1,0	6,0	0,4	13,0	0,8	5,0	0,3	10,0	0,6	4,0	0,2	7,0	0,4	2,0	0,1	3,0	0,2	1,2	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,2	0,1
500	0,50	0,13	17,0	0,9	6,0	0,3	13,0	0,7	5,0	0,2	10,0	0,5	4,0	0,2	7,0	0,3	2,0	0,1	3,0	0,2	1,2	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,2	0,1
300	0,30	0,08	17,0	0,5	6,0	0,2	13,0	0,4	5,0	0,1	10,0	0,3	4,0	0,1	7,0	0,2	2,0	0,1	3,0	0,1	1,2	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,2	0,1
100	0,10	0,03	17,0	0,2	6,0	0,1	13,0	0,1	5,0	0,1	10,0	0,1	4,0	0,1	7,0	0,1	2,0	0,1	3,0	0,1	1,2	0,1	2,0	0,1	0,6	0,1	1,0	0,1	0,2	0,1
50	0,05	0,01	17,0	0,1</																										

3.4 Buckling diagrams



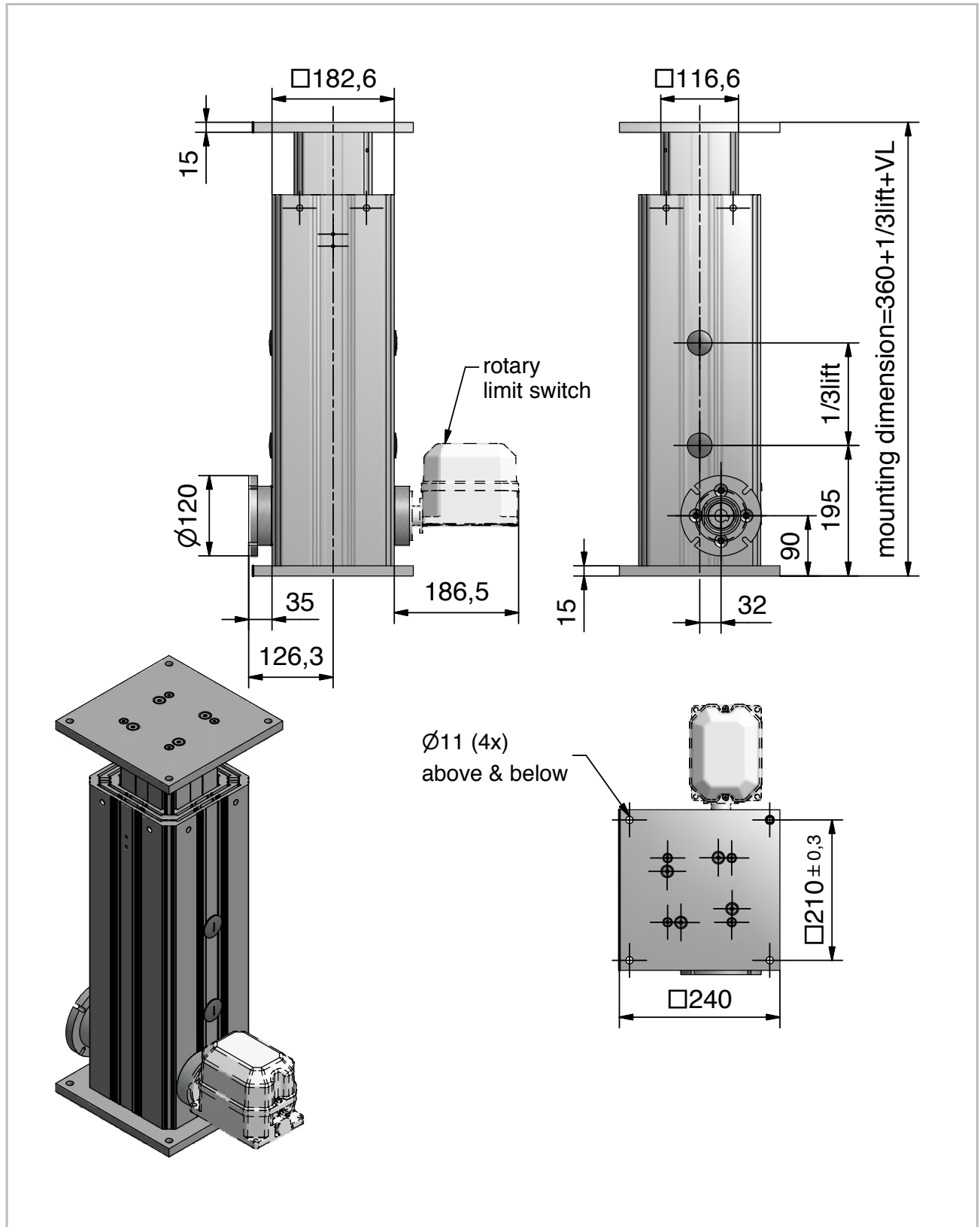
Dimension plans

4.1 Dimension plan PHOENIX PH34



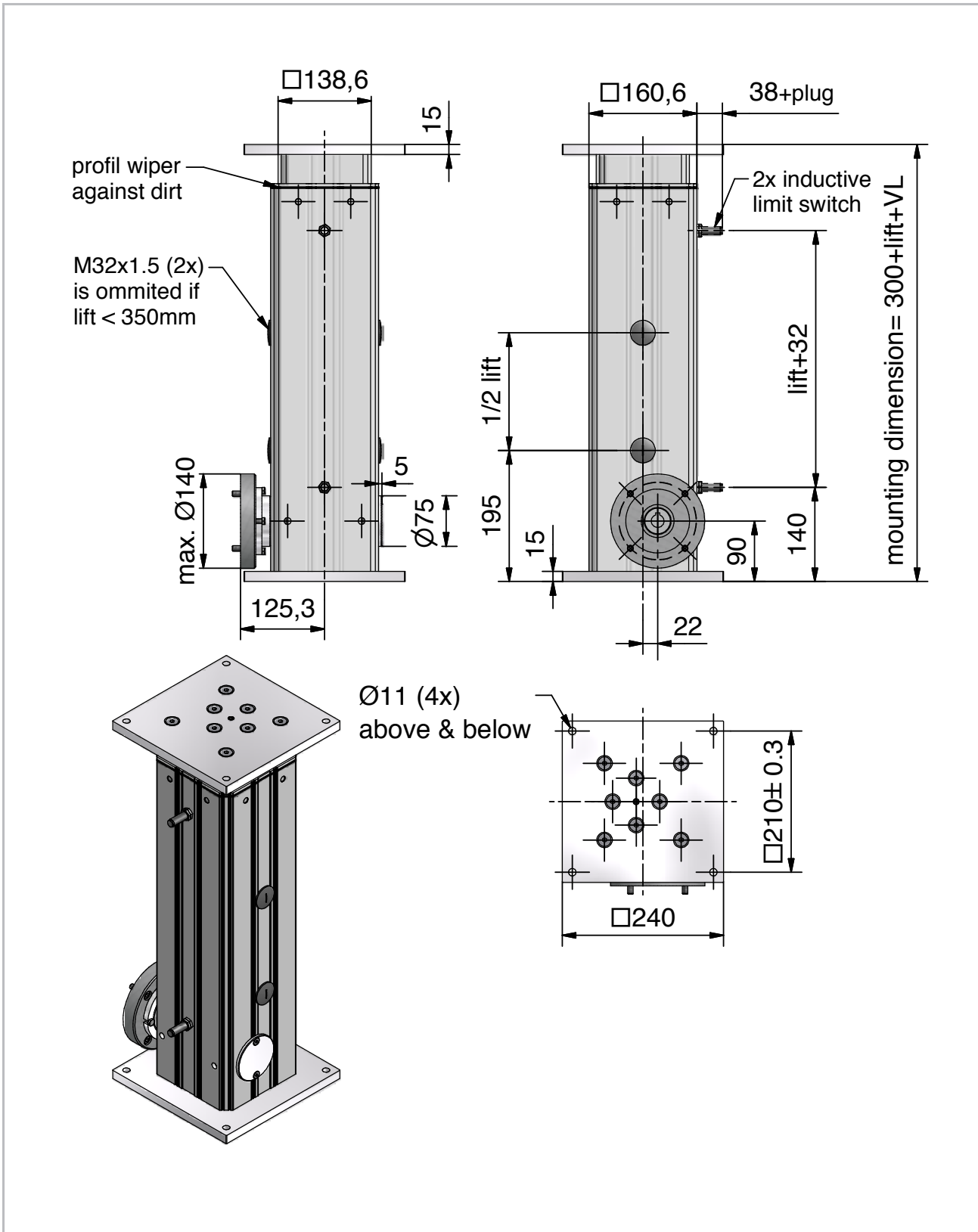
Dimension plans

4.2 Dimension plans PHOENIX PH36



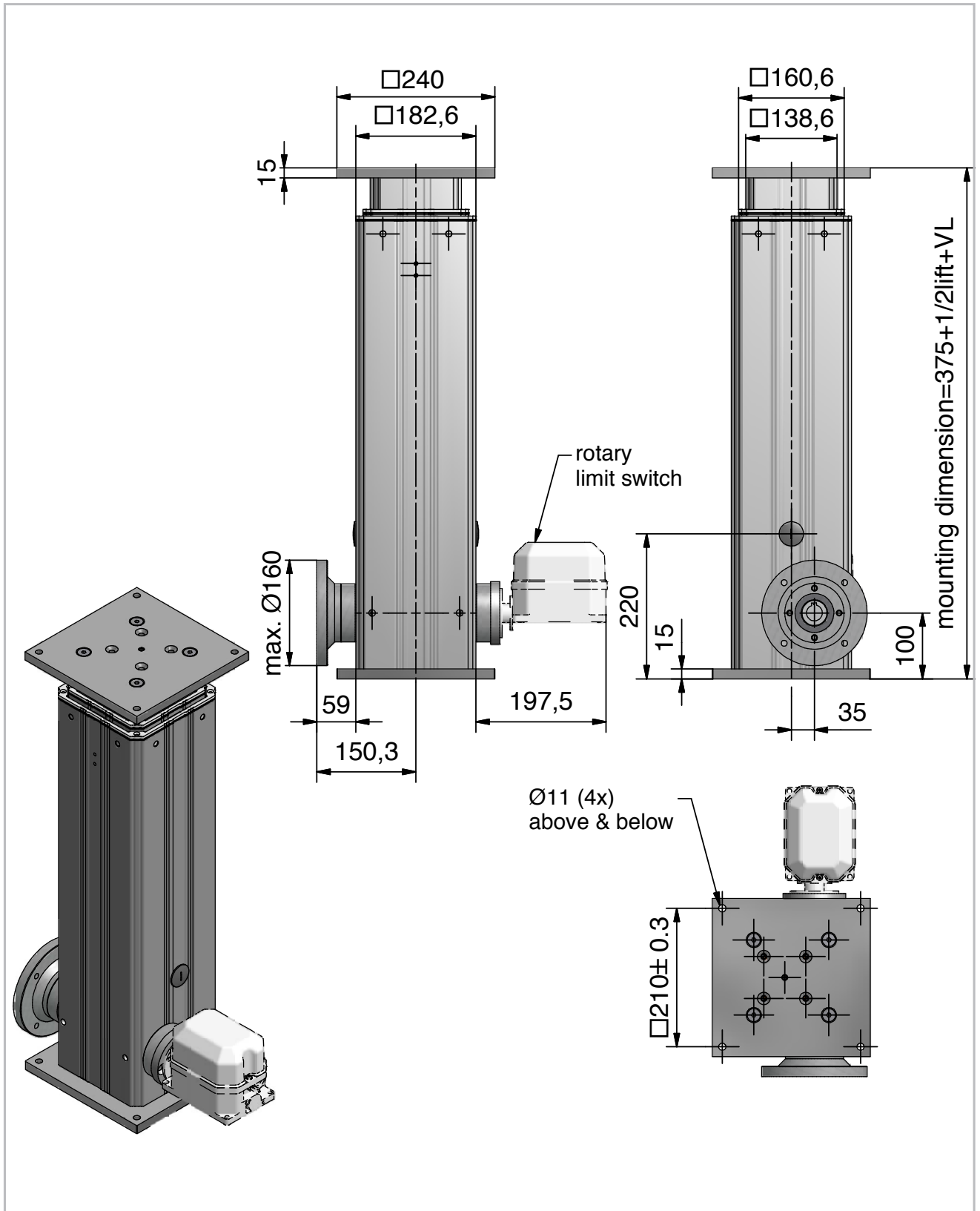
Dimension plans

4.3 Dimension plans PHOENIX PH45



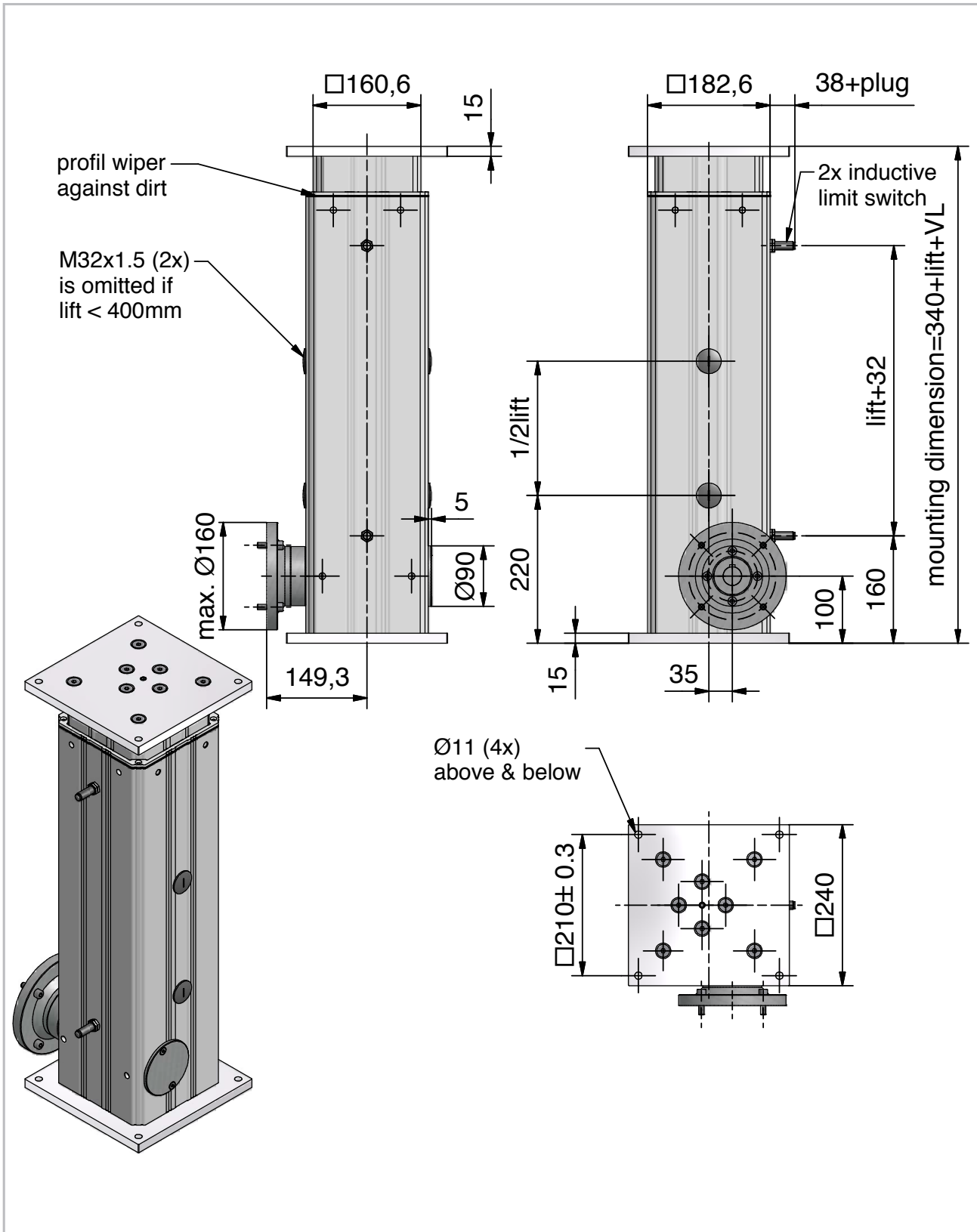
Dimension plans

4.4 Dimension plans PHOENIX PH46



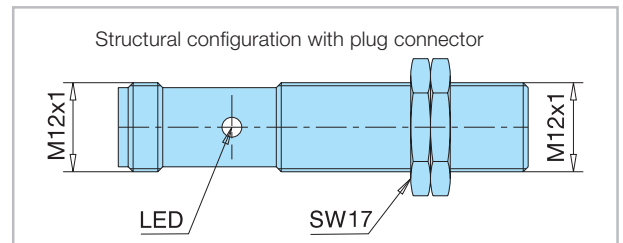
Dimension plans

4.5 Dimension plans PHOENIX PH56



5.1 Inductive limit switch (Standard in single stage lifting columns)

- LED display
- Opener
- Built in amplifier
- Temperature: -25 °C to +70 °C
- Protection class: IP67 according to EN 50010
- Length: 45 mm without plug (short model)
- Voltage: 10-30 V DC
- Output: PNP, NC
- Current load: 200 mA
- Thread: M12x1
- Connection: M12 with 90° angular plug included
- Switching distance: 3 mm



5.2 Gear limit switch (Standard in multi stage lifting columns)

- with EC approval
- fulfills EN Norm: 60947 T5-1; IEC 947-5-1
- Temperature: -40 °C to +80 °C IP65
- Protection class: IP65
- Cable inlet: Cable connecting M20x1,5, Clamping range 5-14 mm
- Switch properties: AC15; Nominal current 1.5A; Nominal voltage 230V; Nominal thermo current 10A; Nominal insulation voltage 250V~



Order Codes

6.1 Order Code PHOENIX

1 Configuration Type ___ PH34; PH45, PH56, PH46	7 Basic construction height _in mm
2 Mounting position ___ M1A / M2A / M2B M3A / M3B / M4A / M4B M5A / M5B / M6A / M6B	8 Ratio _____4:1; 6:1; 16:1; 24:1
3 Head plate _____ ST = Standard; SO = Special ¹⁾	9 Screw & lead _____Tr
4 Foot plate _____ ST = Standard; SO = Special ¹⁾	10 Input-side _____R = right; L = left
5 Lift _____ in mm	11 Output-side _____R = right; L = left
6 Extension _____ in mm	12 Special design _____
	0 = no output-side

1) Drawing required

PH **1** - **2** - **3** - **4** - **5** - **6** - **7** - **8** - **9** - **10** **11** **12**

Example 1: PH34-M1A-ST-ST-300-0-560-16:1-Tr24x5-L-0

PHOENIX PH34 – Mounting position M1A – Head and foot plate standard – 300 mm Lift – no Extension
- 560 mm Basic construction height - Ratio 16:1 - Tr screw 24x5 - Input-side Left - no Output-side

Example 2: PH34-M1A-SO-ST-200-0-460-16:1-T24x10-L-R

PHOENIX PH34 – Mounting position M1A – Head plate special – Foot plate standard – 200 mm Lift
- no Extension - 460 mm Basic construction height - Ratio 16:1 - Tr screw 24x10 - Input-side Left
- Output-side Right



CMCO

COLUMBUS McKINNON



COLUMBUS McKINNON Engineered Products GmbH

Am Silberpark 2 - 8
86438 Kissing/Germany
Phone +49 8233 2121 777
Fax +49 8233 2121 805
sales.kissing@cmco.eu
www.pfaff-silberblau.com

