Yale®

Electric Chain Hoists

Specifications for

CPVF and YJL

General information about electric chain hoists

Apart from the usual criterion such as lifting capacity, lifting speed and dimensions also consider following:

1. Choosing a motor according to FEM 9.683

In addition to the torque the decisive criterion for rating an electric motor is the heat it generates. Here we differentiate between two operational modes:

1.1 Intermittent duty

In this case the motor is designed for a series of equal cycles consisting of duty periods with constant load and rest periods. The heat generation depends on the relative duty cycle, that is, the relationsship between operating period under load, total operating time and the number of starts/hour.

$$ED = \frac{\text{Operating period}}{\text{Operating period + rest periods}} \%$$

The number of cycles that can be made under full load is calculated as follows:

$$S \approx 0.3 \times \frac{ED \times V}{H}$$

S = Cycles per hour
ED = Duty rating in %
V = Lifting speed in m/min
H = Average lifting height in m

A cycle consists of a motion of lifting, lowering and the rest periods. One must ensure that the lifting height does not exceed the value permitted by the percentage duty cycle referred to a cycle period of 10 minutes

$$H \leq \frac{ED \times V}{20}$$

and that simultaneously the permissible number of starts is not exceeded. It is generally accepted that a cycle consists of 6 starts.

1.2 Short time duty

Where special duty conditions exist (e.g. long hook path) the operating period must be of such length that the admissible temperature limit of the motor is not exceeded. For such cases intermittent duty must be replaced by short time duty. That is, the motor may be operated for up to 10 starts over a certain period (with Yale products 30 min). Thereafter the motor must cool down to room temperature.

1.3 Calculation example intermittant duty

Electric hoist	:	CPV 5-8
Lifting speed	:	8 m/min
Lifting height	:	2.8 m
Duty rating ED	:	50 %
c/h	:	180

Number of cycles per hour.

$$S = 0.3 \times \frac{50 \times 8}{} = 42.8$$

Max. lifting height

$$H = 2.8 \leq \frac{50 \times 8}{20} = 20 \text{ m}$$

Number of starts

$$N = \frac{25 \text{ cycles}}{\text{hour}} \times \frac{6 \text{ starts}}{\text{cycle}} = 150 \text{ c/h}$$

2. Classification of hoisting equipment according to FEM 9.511

To choose an optimal hoist the lifting capacity and also the classification group must be known. The classification group indicates the theoretical operating time of the mechanical components under full load:

Classification group	FEM ISO	1 Bm M3	1 Am M4	2 m M5	3 m M6
Operating time in h		400	800	1600	3200

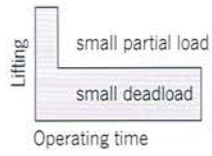
If the hoist is operated as classified an actual operating time of around 10 years can be expected.
After this period a general overhaul is necessary.

To define the classification group following values must be determined:

2.1 Average operating time per day

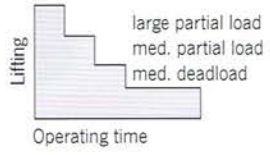
The average operating time can be estimated or calculated as follows:

$$\text{Operating time/day} = \frac{2 \times \text{average hook path} \times \text{cycles/hour} \times \text{operating time/day}}{60 \times \text{lifting speed}}$$



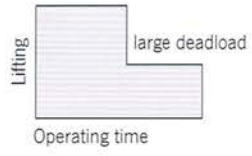
1 light

Hoists or parts thereof usually subject to very small loads and in exceptional cases only to maximum loads.



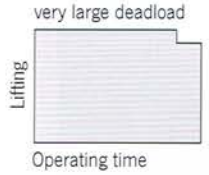
2 medium

Hoists or parts thereof usually subject to small loads but rather often to maximum loads.



3 heavy

Hoists or parts thereof usually subject to medium loads but frequently to maximum loads.



4 very heavy

Hoists or parts thereof usually subject to maximum or almost maximum loads.

2.2 Load spectrum

The load spectrum indicates to what extent a hoist or part thereof is subject to maximal stress or whether it is subject to smaller loads only. It can be calculated or estimated according to the diagrams on the right:

2.3 Classification

The classification group is defined by operating hours and load spectrum:

Load spectrum	Aver. op. hours per working day		
1 light	up to 2	2-4	4-8
2 medium	up to 1	1-2	2-4
3 heavy	up to 0.5	0.5-1	1-2
4 very heavy	up to 0.25	0.25-0,5	0.5-1
Classification group acc. to FEM/ISO	1 Bm/M3	1 Am/M4	2 m/M5

The advantages at a glance

Quality engineering –

Innovative design, utilizing the most modern material and precise manufacturing processes leading to increased safety and reduced maintenance time.

Easy access –

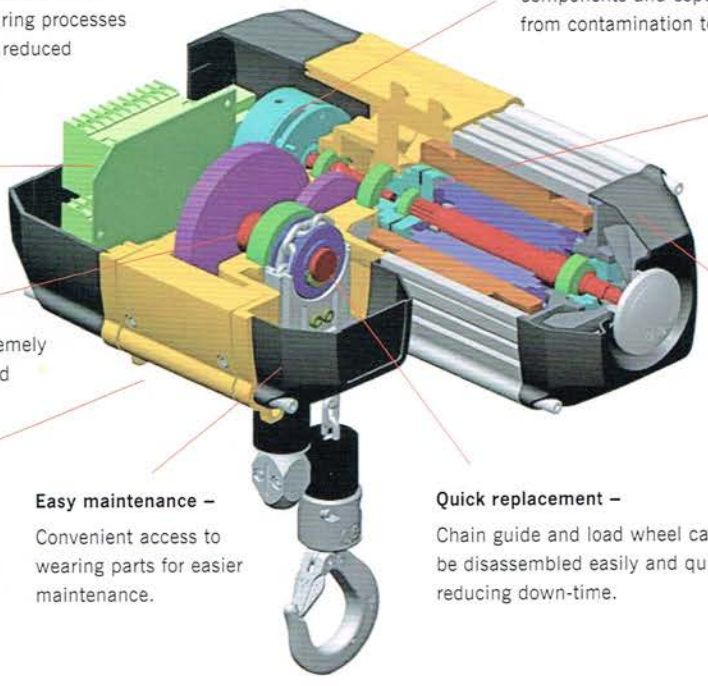
Easily removable housing cover giving direct access to all electrical connections.

Smooth running –

Helical gearing ensures an extremely low noise level and an increased operational lifetime.

Additional advantage –

Direct access to the chain end anchor for hoists with double chain fall.



Easy maintenance –

Convenient access to wearing parts for easier maintenance.

Improved protection –

The enclosed design protects electrical components and especially the load brake from contamination to level IP 55 as standard.

Increased safety –

The externally adjustable slip clutch is designed to guarantee a permanent connection between the load and the brake, even in extreme cases of overload.

High impact resistance –

Robust housing covers made from polyamide.

Quick replacement –

Chain guide and load wheel can be disassembled easily and quickly reducing down-time.

Electric chain hoist model CPVF with suspension lug or with integrated trolley

Capacity 250 - 2000 kg

The electric chain hoist model CPVF combines modern design and technical innovation. A robust construction makes the series a versatile tool for professional applications.
The integrated limit switch for the highest and lowest hook position considerably extends the working life span of the slip clutch, motor and gearbox.

Standard Features

- Main contactor as standard, for increased safety.
- Increased operating safety through 42 V control voltage (low voltage control), push-button pendant control, IP 65.
- Lifetime lubricated gearbox.
- 50% ED for single speed. Slow 17% ED, fast 33% ED for double speed.
- Electromagnetic spring pressure brake holds the load safely even in the event of power failure.
- Motor protected to IP 55 (acc. to VDE 0530), against ingress of dust and water jets.
- The externally adjustable slip clutch is designed to guarantee a permanent connection between the load and the brake.
- The standard, oil bath lubricated and case hardened gearbox has a helical gearing for particularly smooth running and enhanced lifetime.
- Suspension lug for compact dimensions and easy integration in closed-eye constructions.

Options

- Flexible chain container.
- Control for synchronized operation of several hoists.
- Manual and electric trolleys.
- Suspension for light crane systems.

Standard:	FEM
Duty Class:	1AM/M4
	* Working capacity reduces by 20%, duty class can be upgraded by 1 rating.
Operating Temperature:	-10 ° – 40 °
Power Supply:	380V-3PH-50Hz, 415V-3PH-50Hz, 460V-3PH-60Hz
Control Voltage:	42V

Specifications model CPVF

Model	Stanard lifting height m	Capacity kg Rating 1AM (FEM) M4 (ISO)	Alternative Ratings		No. of chain falls	Chain dimensions d x p mm	Lifting speed* main lift at 50Hz m/min	Lifting speed* fine lift at 50Hz m/min	Hoist motor kW	Motor rating ED %	Weight suspension lug kg	Weight push trolley** kg	Weight motor-driven trolley kg
			2m/M5	3m/M6									
CPVF 2-8	3	250	200	160	1	4 x 12.2	8	2	0.37/0.09	33/17	25	40	48
CPVF 5-4	3	500	400	320	2	4 x 12.2	4	1	0.37/0.09	33/17	26	41	49
CPVF 5-8	3	500	400	320	1	5 x 15.1	8	2	0.75/0.18	33/17	27	42	50
CPVF 10-4	3	1000	800	630	2	5 x 15.1	4	1	0.75/0.18	33/17	29	44	52
CPVF 10-8	3	1000	800	630	1	7.1 x 20.5	8	2	1.5/0.37	33/17	59	78	85
CPVF 20-4	3	2000	1600	1250	2	7.1 x 20.5	4	1	1.5/0.37	33/17	64	83	90

* All the speed data above is based on 50Hz. If rated power is 60Hz, the speed increases by 20%.
** For trolleys type A and B: Additional weight for geared trolley: 2.5 kg
***Higher speed version 20m/min on request. Please consult factory.

Yale hoists and trolleys are not designed for passenger elevation applications and must not be used for this purpose.

Increased operating safety through 42 V control voltage

Externally adjustable slip clutch.

Integrated limit switch

Depicted suspension hook and chain container optionally available.

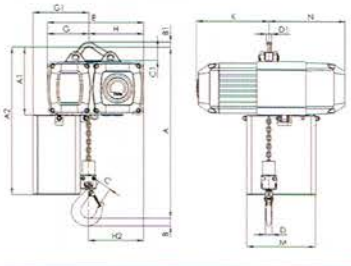
3-button pendant. (5-button pendant is also available to offer.)

Specifications motor-driven trolleys

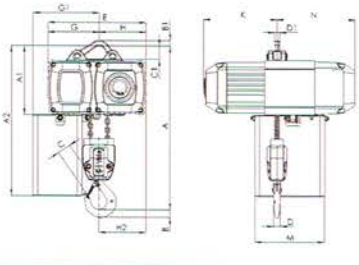
Trolley model	Trolley Capacity kg	Size	Beam flange width b mm	Beam flange thickness t max. mm	Curve radius min. m	Electric trolley travel speed m/min at 50 Hz	Electric trolley motor kW at 50 Hz	Suitable for
VTEF 1000-A	1000	A	58 - 180	19	0.9	18 or 18/4.5	0.18 or 0.18/0.06	CPVF 2-8, CPVF 5-4, CPVF 5-8 CPVF 10-4
VTEF 1000-B	1000	B	180 - 300	19	0.9	18 or 18/4.5	0.18 or 0.18/0.06	
VTEF 2000-A	2000	A	58 - 180	19	1.15	18 or 18/4.5	0.18 or 0.18/0.06	CPVF 10-8 CPVF 20-4
VTEF 2000-B	2000	B	180 - 300	19	1.15	18 or 18/4.5	0.18 or 0.18/0.06	

Dimensions model CPVF with hook/lug suspension

Model	CPVF 2-8	CPVF 5-4	CPVF 5-8	CPVF 10-4	CPVF 10-8	CPVF 20-4
A, mm	357	393	357	430	431	528
A1, mm	196	196	196	196	234	234
A2 (Size I), mm	476	476	476	476	564	564
A2 (Size II), mm	526	526	526	526	644	644
A2 (Size III), mm	606	606	606	606	734	734
A2 (Size IV), mm	798	798	798	798	934	934
B, mm	22	22	22	29	29	37
B1, mm	15	15	15	15	20	20
C, mm	29	29	29	35	35	40
C1, mm	38	38	38	38	45	45
C2, mm	105	105	105	105	154	154
D, mm	15	15	15	21	21	26
D1, mm	15	15	15	15	15	15
E, mm	277	277	277	277	326	326
G, mm	120	144	120	144	140	173
G1 (Size I), mm	142	166	142	166	175	208
G1 (Size II), mm	162	186	162	186	175	208
G1 (Size III), mm	162	186	162	186	175	208
G1 (Size IV), mm	162	186	162	186	175	208
H, mm	157	133	157	133	186	154
H2, mm	158	158	158	158	186	186
K (CPV), mm	208	208	208	208	285	285
K (CPVF), mm	208	208	208	208	285	285
M (Size I), mm	162	162	162	162	209	209
M (Size II), mm	197	197	197	197	209	209
M (Size III), mm	197	197	197	197	209	209
M (Size IV), mm	197	197	197	197	209	209
N, mm	219	219	219	219	274	274



Model CPVF with lug suspension, 250 - 1000 kg, single fall

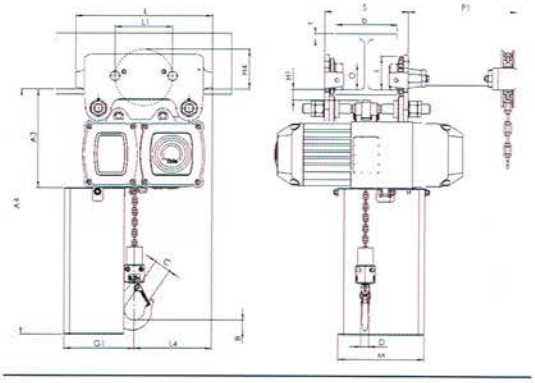


Model CPVF with lug suspension, 250 - 1000 kg, double fall

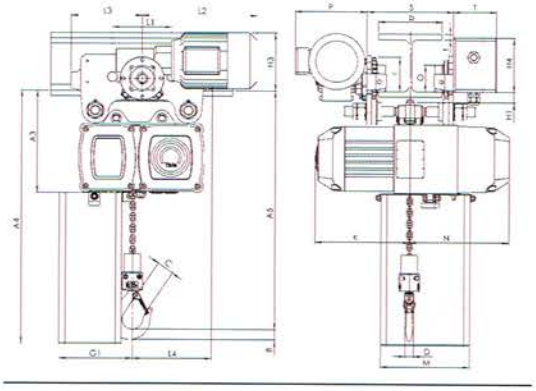
Model CPVF with hook suspension, 250 - 2000 kg

Dimensions model CPVF with integrated trolley

Model	CPVF 2-8	CPVF 5-4	CPVF 5-8	CPVF 10-4	CPVF 10-8	CPVF 20-4
A3, mm	228	228	228	228	263	263
A4 (Size I), mm	508	508	508	508	593	593
A4 (Size II), mm	558	558	558	558	673	673
A4 (Size III), mm	638	638	638	638	768	768
A4 (Size IV), mm	830	830	830	830	968	968
A5, mm	389	425	389	462	460	558
b, mm	A = 50 - 180/ B = 180 - 300	A = 50 - 180/ B = 180 - 300	A = 50 - 180/ B = 180 - 300	A = 50 - 180/ B = 180 - 300	A = 50 - 180/ B = 180 - 300	A = 50 - 180/ B = 180 - 300
H1, mm	24	24	24	24	23	23
H3, mm	129	129	129	129	129	129
H4 (VTG), mm	95	95	95	95	95	95
H4 (VTE), mm	142	142	142	142	142	142
I (Pushed trolley), mm	72	72	72	72	96	96
I (Geared trolley), mm	77	77	77	77	98	98
L(VTP/VTG), mm	310	310	310	310	360	360
L1, mm	130	130	130	130	150	150
L2 (CPV), mm	255	255	255	255	255	255
L2 (CPVF), mm	263	263	263	263	263	263
L3, mm	155	155	155	155	180	180
L4, mm	161	161	161	161	203	203
O, mm	60	60	60	60	80	80
P, mm	200	200	200	200	200	200
P1, mm	246	246	246	246	246	246
S, mm	b + 50	b + 50	b + 50	b + 50	b + 54	b + 54
T, mm	94	94	94	94	94	94
tmax., mm	19	19	19	19	19	19



Model CPVF with manual push or geared trolley



Model CPVF with motor-driven trolley

Electric chain hoist model YJL

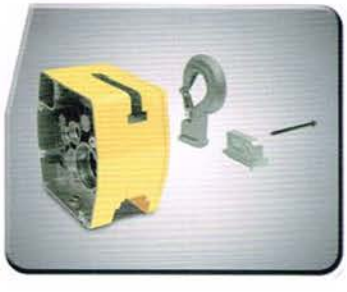
Capacity 250 - 2000 kg

Standard Features

- **Five-Pocket Load Sheave –** Increased chain and sheave engagement 25% over hoists with conventional four-pocket sheaves. Provides smoother lifting and reduces chain wear.
- **Mechanical Overload Protection Device –** Helps protect hoist, operator, and supporting structures from damaging overloads, chain jamming and reverse phasing.
- **Limit Switches –** Adjustable to regulate upper and lower load travel. Brass nuts standard for improved repeatability and chain positioning.
- **Multiple Disc Motor Brake –** Heavy duty design for reliable operation. Direct acting for positive load holding and spotting.
- **Chain End Stop Assembly –** Fits below dead end link on lifting chain for added measure of protection.
- **Oil Bath Transmission –** Precision machined alloy steel gears run in oil bath for longer, quieter operation.
- **Manual and Motorized trolleys –** Single and Dual Speed Models.
- **Wrap-Around Side Plates –** Act as safety lugs and as bumpers to protect wheels. Available to fit American Standard I-Beams, wide-flange, and patented track beams.
- **Precision Trolley Wheels –** Dual tread trolley wheels fit either flat or tapered I-Beams. Also available in bronze or stainless steel.

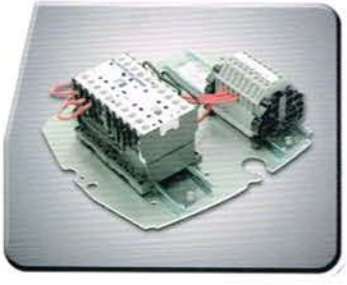
Options

- Trolley Bumpers (if with manual or motor-driven trolley)
- Galvanized Load Chain



Easy Change Top Suspension

Quick Connect Chain Container
(load chain max. 6m)
Other chain container on request
when load chain is over 6m.



IEC Controls

Standard:	ASME
Duty Class:	H4
Operating Temperature:	-23 C - 54 C
Power Supply:	380V-3PH-50Hz, 460V-3PH-60Hz, 415V-3PH-50Hz (made to order)
Control Voltage:	24V

Specifications model YJL with hook / lug suspension

Model	Capacity kg	Standard lifting height m	Lift speed** at 50 Hz m/min	Motor kW	No.of chains	Headroom mm		Net weight kg	
						-TH	-LG	-TH	-LG
YJL1/4-32(*)	250	3	8.0/2.7	0.37	1	460	428	34	34
YJL 1/2-32(*)	500	3	8.0/2.7	0.75	1	460	428	40	40
YJL1-16(*)	1000	3	4.0/1.3	0.75	1	460	428	41	41
YJL2-8(*)	2000	3	2.0/0.7	0.75	2	530	498	45	45

* Insert "TH" when top hook suspension. Insert "LG" when lug suspension.
** All the speed data above is based on 50Hz. If rated power is 60Hz, the speed increases by 20%.

Specifications model YJL with plain / geared trolley

Model	Capacity kg	Standard lifting height m	Beam flange width** mm	Min. Rad. Curve m	Headroom mm	Net weight kg	
						-TH	-LG
YJL1/4-32(*)	250	3	65 - 222	1.15	451	52	55
YJL 1/2-32(*)	500	3	65 - 222	1.15	451	58	61
YJL1-16(*)	1000	3	65 - 222	1.15	451	59	62
YJL2-8(*)	2000	3	65 - 222	1.15	521	63	66

* Insert "PT" when plain trolley. Insert "GT" when geared trolley.
** Special flange width on request. Please consult factory.

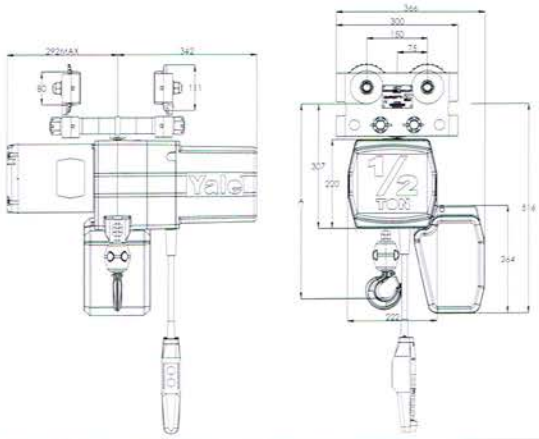
Specifications model YJL with motor-driven trolley

Model	Capacity kg	Standard lifting height m	Beam flange width*** mm	Min. Rad. Curve m	Electric trolley travel speed** at 50 Hz m/min	Headroom mm	Net Weight kg
YJL1/4-32(MT)	250	3	65 - 222	1.15	18/4.5	466	82
YJL 1/2-32(MT)	500	3	65 - 222	1.15	18/4.5	466	88
YJL1-16(MT)	1000	3	65 - 222	1.15	18/4.5	466	89
YJL2-8(MT)	2000	3	65 - 222	1.15	18/4.5	536	93

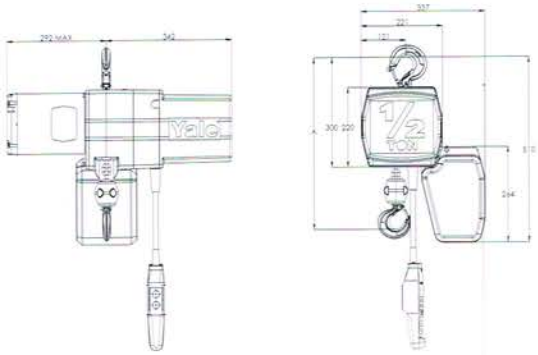
** All the speed data above is based on 50Hz. If rated power is 60Hz, the speed increases by 20%.
*** Special flange width on request. Please consult factory.

Dimensions model YJL

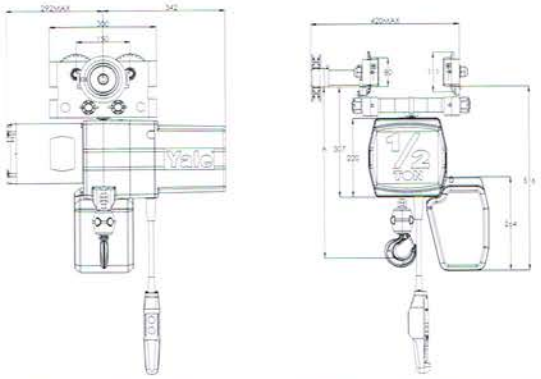
Model	1/4t	1/2t	1t	2t
A(Hook), mm	460	460	460	530
A(Lug), mm	428	428	428	498
A(PT), mm	451	451	451	521
A(GT), mm	451	451	451	521
A(MT), mm	466	466	466	536



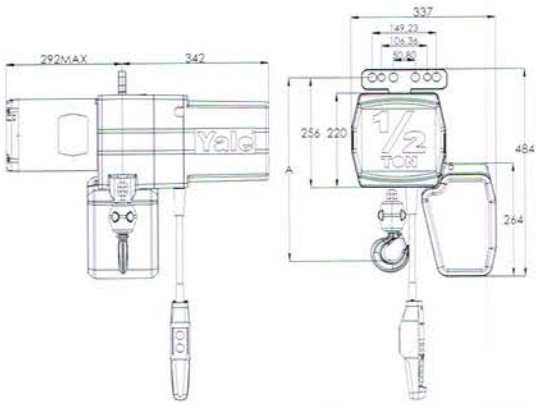
Model YJL with plain trolley, 250 - 2000 kg



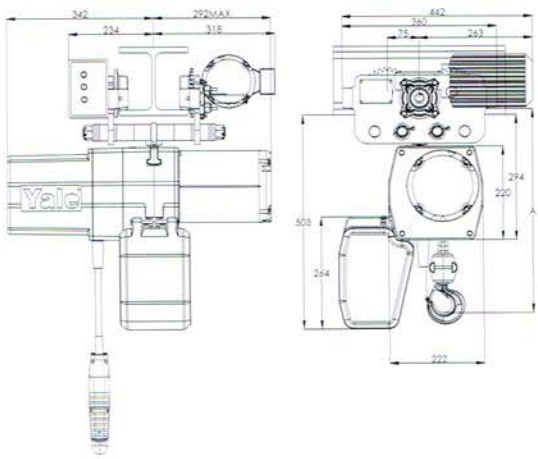
Model YJL with hook suspension, 250 - 2000 kg



Model YJL with geared trolley, 250 - 2000 kg



Model YJL with lug suspension, 250 - 2000 kg



Model YJL with motor-driven trolley, 250 - 2000 kg

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CPVF/YJL - V1 - 1405(EN)