TECHNICAL GUIDE; CHARACTERISTICS

Characteristics (SI/50Hz)

SI

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SWF Krantechnik GmbH
Postbox 310410
68264 Mannheim
Germany

Boehringer Straße 4
68307 Mannheim
Germany

tel +49(0)621 789-900
fax +49(0)621 789 90-100
Info@swfkrantechnik.com
www.swfkrantechnik.com

Original instructions

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1 HOIST STANDARD FEATURES

1.1 NB Standard features

Features for…	
Hoisting	❑ Mechanical limit switch as overload protector ❑ 4-step hoisting limit switch (hook low, hook up slow down, stop and phase mismatch protection)
Hoist motor	❑ Two-speed pole-change hoisting motor, 6:1 speed ratio ❑ 60 % ED ❑ F class insulation ❑ IP55 protection ❑ Klixon type bimetal switch for thermal protection
Hook	❑ 2-roped: Hook forging strength class V DIN15400, size RSN1 DIN15401 ❑ 4-roped: Hook forging strength class V DIN15400, design HBC with hand grip, size min. 1.6 (DIN15401) ❑ Safety latch
Rope reeving	❑ EN-GJS-700-3 cast iron rope guide incl. pressure roll for slack rope protection. Machinery hoists: pressure bar along the drum to hold the rope ❑ EN-GJS-500-7 rope sheaves ❑ Rope sheave / rope diameter ratio according to ISO M6 duty class as minimum
Travelling	❑ Low headroom trolley flange width range 80–410 mm. *Factory settings max. width or package size* ❑ Normal headroom trolley flange width range 80–450 mm ❑ Medium double girder trolley rail gauges 1200, 1400, 1700, 2000 mm ❑ High mounted double girder trolley rail gauge 900, 1200, 1400, 1700, 2000 mm ❑ One travel motor in trolley. In N-trolley the amount depends on reeving system ❑ EN-GJS-500-7 cast iron flanged rail wheels, 2 driven by travelling machinery. The wheel groove width is 65 mm as standard for douple girder trolley ❑ 4 pcs rubber buffers ❑ Jump-off protection in single girder trolleys (N, L) ❑ Axle failure protection in both double and single girder trolleys
Travel machinery	❑ Frequency converter motor with compact brake, DMCS controller in hoist panel ❑ Two adjustable speeds with ramp functions min. 5 m/min, max. 20 m/min (MS2-control). *Factory settings 20 / 5*. ❑ 40 % ED
Electrical outfit	❑ Standard 3-phase voltages 50Hz: 220V*, 230V*, 240V*, 380V, 400V, 415V, 500V*, 525V* ❑ Standard 3-phase voltages 60Hz: 220V*, 230V*, 240V*, 440V, 460V, 480V, 575V*, 600V* ❑ (*additional price and delivery time) ❑ Standard control voltages 48V / 50Hz, 115V / 50Hz or 60Hz, 230V / 50Hz or 60Hz ❑ Assembly according to IEC standards ❑ IP 55 / NEMA 4 steel control panel ❑ Electrics for single hoist use in crane application (main contactor nor control voltage transformer not included) ❑ Plug in connectors for power supply and control cables
Environment	❑ Ambient temperature –10 °C…+40°C
Surface treatment	❑ Epoxy paint. Thickness 100/120 µ (Powder/Wet painting) for load carrying parts
Marking	❑ Hoist type plate incl. CE mark ❑ Rope code sticker ❑ Hoist stickers: brand name and type designation ❑ Hook stickers: brand name and load
Documents	❑ 1 pcs Hoist Owner's Manual ❑ Hoist test certificate ❑ Wire rope certificate ❑ Hook certificate
Delivery	❑ Enclosed plywood box length 1530 mm x width 780 mm x height 570 mm for L and N –trolleys ❑ Wooden grate packing for double girder trolleys. Size according to the trolley ❑ Anticorrosion plastics around the hoist

1.2 NC Standard features

Features for…	
Hoisting	❑ Mechanical limit switch as overload protector ❑ 4-step hoisting limit switch (hook low, hook up slow down, stop and phase mismatch protection)
Hoist motor	❑ Two-speed pole-change hoisting motor, 6:1 speed ratio ❑ 60 % ED ❑ F class insulation ❑ IP55 protection ❑ Klixon type bimetal switches for thermal protection
Hook	❑ 2-roped: Hook forging strength class V DIN15400, size RSN1 DIN15401 ❑ 4-, 6- and 8-roped: Hook forging strength class V DIN15400, design HBC with hand grip, size min. 2.5 (DIN15401) ❑ Safety latch
Rope reeving	❑ EN-GJS-700-3 cast iron rope guide incl. pressure roll for slack rope protection. Machinery hoists: pressure bar along the drum to hold the rope ❑ EN-GJS-500-7 rope sheaves ❑ Rope sheave / rope diameter ratio according to ISO M6 duty class as minimum
Travelling	❑ Low headroom trolley flange width range 100–490 mm. *Factory settings max. width or the package size* ❑ Normal headroom trolley flange width range 80 – 450 mm ❑ Medium double girder trolley rail gauges 1200, 1400, 1700, 2000 mm (depends on H.O.L.) ❑ High mounted double girder trolley rail gauge 900, 1200, 1400, 1700, 2000 mm ❑ One travel motor in trolley. In N-trolley the amount depends on reeving system ❑ EN-GJS-500-7 cast iron flanged rail wheels, 2 driven by travelling machinery. The wheel groove width is 65 mm as standard for douple girder trolley ❑ 4 pcs rubber buffers ❑ Jump-off protection in single girder trolleys (N, L) ❑ Axle failure protection in both double and single girder trolleys
Travel machinery	❑ Frequency converter motor with compact brake, DMCS controller in hoist panel ❑ Two adjustable speeds with ramp functions min. 5 m/min, max. 20 m/min (MS2-control). *Factory settings 20 / 5* ❑ 40 % ED
Electrical outfit	❑ Standard 3-phase voltages 50Hz: 220V*, 230V*, 240V*, 380V, 400V, 415V, 500V*, 525V* ❑ Standard 3-phase voltages 60Hz: 220V*, 230V*, 240V*, 440V, 460V, 480V, 575V*, 600V* ❑ (*additional price and delivery time) ❑ Standard control voltages 48V / 50Hz, 115V / 50Hz or 60Hz, 230V / 50Hz or 60Hz ❑ Assembly according to IEC standards ❑ IP 55 steel control panel ❑ Electrics for single hoist use in crane application (main contactor or control voltage transformer not included) ❑ Plug in connectors for power supply and control cables
Environment	❑ Ambient temperature –10 °C…+40°C
Surface treatment	❑ Epoxy paint. Thickness 100/120 μ (Powder/Wet painting) for load carrying parts
Marking	❑ Hoist type plate incl. CE mark ❑ Rope code sticker ❑ Hoist stickers: brand name and type designation ❑ Hook stickers: brand name and load
Documents	❑ 1 pcs Hoist Owner's Manual ❑ Hoist test certificate ❑ Wire rope certificate ❑ Hook certificate
Delivery	❑ Wooden grate packing. Size according to the trolley ❑ Anticorrosion plastics around the hoist

1.3 ND Standard features

Features for…	
Hoisting	❑ Mechanical limit switch as overload protector ❑ 4-step hoisting limit switch (hook low, hook up slow down, stop and phase mismatch protection)
Hoist motor	❑ Two-speed pole-change hoisting motor, 6:1 speed ratio ❑ 60 % ED ❑ F class insulation ❑ IP55 protection ❑ Klixon type bimetal switches for thermal protection
Hook	❑ Hook forging strength class V DIN15400 ❑ Hook forging design HBC with handgrip, 4-roped size min. 5.0 (DIN15401), 2-roped models size min. 2.5 ❑ 6- and 8-roped models with forging type RSN6 (DIN15401) ❑ Safety latch
Rope reeving	❑ EN-GJS-700-3 cast iron rope guide incl. pressure roll for slack rope protection. Machinery hoists: pressure bar along the drum to hold the rope ❑ EN-GJS-500-7 rope sheaves ❑ Rope sheave / rope diameter ratio according to ISO M6 duty class as minimum
Travelling	❑ Low headroom trolley flange width range 100 – 610 mm. *Factory settings max. width or package size* ❑ Normal headroom trolley flange width ranges 04/02-roped 80–610 mm, 06/08-roped 80-610 mm ❑ Medium double girder trolley rail gauges 1400, 1700, 2000, 2400 mm (depends on H.O.L. and rope reeving) ❑ High mounted double girder trolley rail gauge 1200, 1400, 1700, 2000, 2400 mm ❑ Low double girder trolley rail gauges 1400, 1700, 2000 mm (depends on H.O.L.) ❑ Two travel motors in double girder trolley. In N-trolley the amount depends on reeving system ❑ EN-GJS-500-7 cast iron flanged rail wheels, groove width 65 mm, 2 driven by travelling machineries ❑ EN-GJS-500-7 cast iron flanged rail wheels, 2 driven by travelling machinery. The wheel groove width is 65 mm as standard for douple girder trolley ❑ 4 pcs rubber buffers ❑ Jump-off protection in single girder trolleys (N, L) ❑ Axle failure protection in both double and single girder trolleys
Travel machinery	❑ Frequency converter motor with compact brake, DMCS controller in hoist panel ❑ Two adjustable speeds with ramp functions min. 5 m/min, max. 20 m/min (MS2-control). *Factory settings 20 / 5* ❑ 40 % ED
Electrical outfit	❑ Standard 3-phase voltages 50Hz: 220V*, 230V*, 240V*, 380V, 400V, 415V, 500V*, 525V* ❑ Standard 3-phase voltages 60Hz: 220V*, 230V*, 240V*, 440V, 460V, 480V, 575V*, 600V* ❑ (*additional price and delivery time) ❑ Standard control voltages 48V / 50Hz, 115V / 50Hz or 60Hz, 230V / 50Hz or 60Hz ❑ Assembly according to IEC standards ❑ IP 55 / NEMA 4 steel control panel ❑ Electrics for single hoist use in crane application (main contactor or control voltage transformer not included) ❑ Plug in connectors for power supply and control cables
Environment	❑ Ambient temperature –10 °C…+40°C
Surface treatment	❑ Epoxy paint. Thickness 100/120 μ (Powder/Wet painting) for load carrying parts
Marking	❑ Hoist type plate ❑ Rope code sticker ❑ Hoist stickers: brand name and type designation ❑ Hook stickers: brand name and load
Documents	❑ 1 pcs Hoist Owner's Manual ❑ Hoist test certificate ❑ Wire rope certificate ❑ Hook certificate
Delivery	❑ Wooden grate packing. Size according to the trolley ❑ Anticorrosion plastics around the hoist

1.4 NE Standard features

Features for…	
Hoisting	❑ Mechanical limit switch as overload protector ❑ 4-step hoisting limit switch (hook low, hook up slow down, stop and phase mismatch protection)
Hoist motor	❑ Two-speed pole-change hoisting motor, 6:1 speed ratio ❑ 60 % ED ❑ F class insulation ❑ IP55 protection ❑ Klixon type bimetal switches for thermal protection
Hook	❑ Load max. 20 t: Hook forging strength class V DIN15400, hook forging design HBC with hand grip, size min. 5.0 (DIN15401) ❑ Load over 20 t: Hook forging strength class T DIN15400, size RSN10 (6- or 2x6-ropes) or RSN16 (8- or 2x8-ropes) DIN15401 ❑ Safety latch
Rope reeving	❑ EN-GJS-700-3 cast iron rope guide. Machinery hoists: pressure bar along the drum to hold the rope ❑ EN-GJS-500-7 rope sheaves ❑ Rope sheave / rope diameter ratio according to ISO M6 duty class as minimum
Travelling	❑ Normal headroom trolley flange width ranges 2-roped *120-610 mm*, 4- and 6-roped 120 – 610 mm , 8-roped 250-610 mm. ❑ Medium double girder trolley rail gauges 1700, 2000, 2400, 2700, 3100, 3400, 3800 and 4200 mm (depends on H.O.L. and rope reeving) ❑ Two travel motors in double girder trolley. In N-trolley the amount depends on reeving system ❑ EN-GJS-500-7 cast iron flanged rail wheels, groove width 65 mm, 2 driven by travelling machineries ❑ 4 pcs rubber buffers ❑ Jump-off and axle failure protection in single girder trolleys (trolley type N)
Travel machinery	❑ Frequency converter motor, inverter controller in hoist panel ❑ Two adjustable speeds with ramp functions min. 5 m/min, max. 20 m/min (MS2-control) *Factory settings 20 / 5.* ❑ 40 % ED
Electrical outfit	❑ Standard 3-phase voltages 50Hz: 220V*, 230V*, 240V*, 380V, 400V, 415V, 500V*, 525V* ❑ Standard 3-phase voltages 60Hz: 220V*, 230V*, 240V*, 440V, 460V, 480V, 575V*, 600V* ❑ (*additional price and delivery time) ❑ Standard control voltages 48V / 50Hz, 115V / 50Hz or 60Hz, 230V / 50Hz or 60Hz ❑ Assembly according to IEC standards ❑ IP 55 / NEMA 4 steel control panel ❑ Electrics for single hoist use in crane application (main contactor or control voltage transformer not included) ❑ Plug in connectors for power supply and control cables
Environment	❑ Ambient temperature –10 °C…+40°C
Surface treatment	❑ Epoxy paint. Thickness 100/120 µ (Powder/Wet painting) for load carrying parts
Marking	❑ Hoist type plate ❑ Rope code sticker ❑ Hoist stickers: brand name and type designation ❑ Hook stickers: brand name and load
Documents	❑ 1 pcs Hoist Owner's Manual ❑ Hoist test certificate ❑ Wire rope certificate ❑ Hook certificate
Delivery	❑ Wooden grate packing. Size according to the trolley ❑ Anticorrosion plastics around the hoist

1.5 NF Standard features

Features for…	❑
Hoisting	❑ Mechanical limit switch as overload protector ❑ 4-step hoisting limit switch (hook low, hook up slow down, stop and phase mismatch protection)
Hoist motor	❑ 2 pcs two-speed pole-change hoisting motor, 6:1 speed ratio ❑ 60 % ED ❑ F class insulation ❑ IP55 protection ❑ Klixon type bimetal switches for thermal protection
Hook	❑ Load max. 20 t: Hook forging strength class V DIN15400, hook forging design HBC with hand grip, size min. 5.0 (DIN15401) ❑ Load over 20 t: Hook forging strength class T DIN15400, size RSN16 (2x4-roped), RSN20 (2x6-roped) or RSN25 (2x8 roped) DIN15401 ❑ Safety latch
Rope reeving	❑ True vertical rope reeving ❑ EN-GJS-700-3 cast iron rope guide. Machinery hoists: pressure bar along the drum to hold the rope ❑ EN-GJS-500-7 rope sheaves ❑ Rope sheave / rope diameter ratio according to ISO M6 duty class as minimum
Travelling	❑ Medium double girder trolley rail gauges 1700, 2000, 2400, 2700, 3100, 3400, 3800 and 4200 mm (depends on H.O.L. and rope reeving) ❑ Two travel motors in trolley ❑ EN-GJS-500-7 cast iron flanged rail wheels, groove width 65 mm, 2 driven by travelling machineries ❑ 4 pcs rubber buffers
Travel machinery	❑ Frequency converter motor, inverter controller in hoist panel ❑ Two adjustable speeds with ramp functions min. 5 m/min, max. 20 m/min (MS2-control) *Factory settings 20 / 5* ❑ 40 % ED
Electrical outfit	❑ Standard 3-phase voltages 50Hz: 220V*, 230V*, 240V*, 380V, 400V, 415V, 500V*, 525V* ❑ Standard 3-phase voltages 60Hz: 220V*, 230V*, 240V*, 440V, 460V, 480V, 575V*, 600V* ❑ (*additional price and delivery time) ❑ Standard control voltages 48V / 50Hz, 115V / 50Hz or 60Hz, 230V / 50Hz or 60Hz ❑ Assembly according to IEC standards ❑ IP 55 / NEMA 4 steel control panel ❑ Electrics for single hoist use in crane application (main contactor or control voltage transformer not included) ❑ Plug in connectors for power supply and control cables
Environment	❑ Ambient temperature –10 °C…+40°C
Surface treatment	❑ Epoxy paint. Thickness 100/120 μ (Powder/Wet painting) for load carrying parts
Marking	❑ Hoist type plate ❑ Rope code sticker ❑ Hoist stickers: brand name and type designation ❑ Hook stickers: brand name and load
Documents	❑ 1 pcs Hoist Owner's Manual ❑ Hoist test certificate ❑ Wire rope certificate ❑ Hook certificate
Delivery	❑ Wooden grate packing. Size according to the trolley ❑ Anticorrosion plastics around the hoist

1.6 SWF code example (SWF: Nova, Factory: Q)

N	B	04	L	5	A	F	P	2	35	A	T	1	N
	(GE09)	DES27	(DES01)	(DIM01)	GE08	HS06	HM01	HM02	(DIM03) (DIM05)	(HS03)	(TM01)	(EL05)	
1	2	3,4	5	6	7	8	9	10	11,12	13	14	15	16

Pos.	Code	Feature code	Feature	Available properties					
1	**N**		Short product name	N	Nova hoist				
2	**B**	(GE09)	Frame size			GE09 value			GE09 value
				B	303 mm rope drum diameter	A	D	406 mm rope drum diameter	C
				C	355 mm rope drum diameter	B	E	608 mm rope drum diameter	D
							F	608 mm rope drum diameter (2 hoisting motors)	E
3,4	**04**	DES27	Rope reeving code	0	Reeving code		4	Number of rope falls per Rope	
				0	1 rope fixed to drum		1	1 rope fall	
				1	1 rope fixed to drum (in case of 10 rope falls)		2	2 rope falls per rope	
				2	2 ropes fixed to drum, true vertical		4	4 rope falls per rope	
				A	1 x 6.7 rope on C frame drum		6	6 rope falls per rope	
				B	1 x 8 mm rope on D frame drum		8	8 rope falls per rope	
				M1 = Machinery hoist, 1 rope fixed to drum, M2 = Machinery hoist, 2 ropes fixed to drum					
5	**L**	(DES01)	Trolley type			DES01 value			DES01 value
				F	Fixed hoist	F	H	Double girder trolley high connection	H
				V	Machinery hoist	V	M	Double girder trolley medium connection	M
				N	Normal headroom trolley	N	W	Double girder trolley low connection	W
				L	Low headroom trolley	L	A	Two hoist trolley, main	MA
				J	Special low headroom trolley	J	B	Two hoist trolley, aux.	MB
				X	Special trolley	X	T	Twin hoist (common hook)	T
6	**5**	(DIM01)	Hoist duty group			DIM01 value			DIM01 value
				3	ISO M3	M3	6	ISO M6	M6
				4	ISO M4	M4	X	ISO M4 and load increased (6.3t, 12.5 t etc.)	
				5	ISO M5	M5			
7	**A**	GE08	Hoist drum length	A	310 mm rope drum length (if frame size Z, 394 mm)		Z	1400 mm rope drum length	
				B	340 mm rope drum length (if frame size Z, 394 mm)		J	1600 mm rope drum length	
				C	440 mm rope drum length (if frame size Z, 504 mm)		K	1900 mm rope drum length	
				D	540 mm rope drum length		L	2250 mm rope drum length	
				E	660 mm rope drum length		M	2500 mm rope drum length	
				F	810 mm rope drum length		N	2800 mm rope drum length	
				G	1000 mm rope drum length		X	Special drum length	
				H	1250 mm rope drum length				
8	**F**	HS06	Hoisting gear type	E	Hoist speed 4 m/min		H	Hoist speed 8 m/min	
				F	Hoist speed 5 m/min		J	Hoist speed 10 m/min	
				G	Hoist speed 6,3 m/min			Note: Speeds for 4 roped, 50Hz	
9	**P**	HM01	Hoist motor type	P	Pole change motor		E	Ex-proof pole change motor	
				T	Frequency converter motor		O	Single speed motor	
				R	Pole change motor 3:1		C	Cast iron pole change motor	
10	**2**	HM02	Hoisting motor size	#	1-9 as motor power code (A, Z, X) (see technical guide)				
11,12	**35**	(DIM03) (DIM05)	Flange width/ Rail gauge	#	Flange width (L / N trolleys) i.e. 350 mm = 35		#	Rail gauge (D trolleys) i.e. 1200 mm = 12	
13	**A**	(HS03)	Overload device			HS03 value			HS03 value
				A	Mechanical limit switch	MEC	C	Hoist power measurement	POW
				B	Strain gauge	SG	D	Mechanical limit switch and hoist power measure	MECPOW
				N	No overload device	NO			
14	**T**	(TM01)	Trolley motor type			TM01 value			TM01 value
				N	No trolley motor controls		O	Single speed motor	O
				P	Pole change motor	P	T	Frequency converter motor	T
				E	Ex-proof pole change motor	E	C	Steel frame motor	C
15	**1**	(EL05)	Electric provisions			EL05 value			EL05 value
				1	Single hoist for crane	CRANE	5	Only condition monitoring unit	ECM
				2	Hoist for tandem use	TANDEM	6	Hoist with universal bridge panel	UNV
				3	Solo hoist	SOLO	7	Twin hoist use	TWIN
				4	Hoist without electric controls	NO	8	Hoist with all crane electrics	ALL
16	**N**		Special properties	N	Standard hoist without any options		S	Special properties	
				F	Options selected only from feature list				

2 TECHNICAL CHARACTERISTICS

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
400	B	M1							V	3m	M6	A	24	400	B	*	F	134.2	P 1	20/3.3	8	F	134.2	T	1	20	8
												C	38				G	106	P 2	25/4.2	10	G	106	T	2	25	10
																	H	87.7	P 3	32/5.3	12.8	H	87.7	T	3	32	12.8
400	B	M2							V	3m	M6	A	7	400	B	*	F	134.2	P 1	20/3.3	8	F	134.2	T	1	20	8
												C	15				G	106	P 2	25/4.2	10	G	106	T	2	25	10
																	H	87.7	P 3	32/5.3	12.8	H	87.7	T	3	32	12.8
500	B	M1							V	2m	M5	A	24	500	B	*	F	134.2	P 1	20/3.3	10	F	134.2	T	1	20	10
												C	38				G	106	P 2	25/4.2	12.5	G	106	T	2	25	12.5
																	H	87.7	P 3	32/5.3	16	H	87.7	T	3	32	16
500	B	M2							V	2m	M5	A	7	500	B	*	F	134.2	P 1	20/3.3	10	F	134.2	T	1	20	10
												C	15				G	106	P 2	25/4.2	12.5	G	106	T	2	25	12.5
																	H	87.7	P 3	32/5.3	16	H	87.7	T	3	32	16
500	B	02	L	H	M		N	F		3m	M6	A	12	250	A		F	134.2	P 1	10/1.7	5	F	134.2	T	1	10	5
												C	19				G	106	P 2	12.5/2.1	6.3	G	106	T	2	12.5	6.3
																	H	87.7	P 3	16/2.7	8	H	87.7	T	3	16	8
	C	A2	L									C	22.5		B		F	160.3	P 2	10/1.7	5	F	160.3	T	2	10	5
												D	30				H	104.7	P 4	16/2.7	8	H	104.7	T	4	16	8
630	B	02	L	H	M		N	F		3m	M6	A	12	315	A		F	134.2	P 1	10/1.7	6.3	F	134.2	T	1	10	6.3
												C	19				G	106	P 2	12.5/2.1	8	G	106	T	2	12.5	8
																	H	87.7	P 3	16/2.7	10	H	87.7	T	3	16	10
	C	A2	L									C	22.5		B		F	160.3	P 2	10/1.7	6.3	F	160.3	T	2	10	6.3
												D	30				H	104.7	P 4	16/2.7	10	H	104.7	T	4	16	10
600	B	M1							V	3m	M6	A	24	600	B	*	F	134.2	P 2	20/3.3	12	F	134.2	T	2	20	12
												C	38				G	106	P 2	25/4.2	15	G	106	T	2	25	15
																	H	87.7	P 3	32/5.3	19.2	H	87.7	T	3	32	19.2
600	B	M2							V	3m	M6	A	7	600	B	*	F	134.2	P 2	20/3.3	12	F	134.2	T	2	20	12
												C	15				G	106	P 2	25/4.2	15	G	106	T	2	25	15
																	H	87.7	P 3	32/5.3	19.2	H	87.7	T	3	32	19.2
800	B	M1							V	2m	M5	A	24	800	B	*	F	134.2	P 2	20/3.3	16	F	134.2	T	2	20	16
	C	A2	L									C	22.5		B		F	160.3	P 2	10/1.7	8	F	160.3	T	2	10	8

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor		Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio			(m/min)		Type	Ratio			(m/min)	
												D	30				H	104.7	P	4	16/2.7	12.8	H	104.7	T	4	16	12.8
1000	Z	02	J							2m	M5	B	6	500	N		E	133.8	P	X	8/1.3	8						
												B	12				E	133.8	O	X	8	8						
	B	02	L	H	M		N	F				A	12		A		F	134.2	P	1	10/1.7	10	F	134.2	T	1	10	10
												C	19				G	106	P	2	12.5/2.1	12.5	G	106	T	2	12.5	12.5
																	H	87.7	P	3	16/2.7	16	H	87.7	T	3	16	16
	C	A2	L									C	22.5		B		F	160.3	P	2	10/1.7	10	F	160.3	T	2	10	10
												D	30				H	104.7	P	4	16/2.7	16	H	104.7	T	4	16	16
1000	B	04	L	H	M		N	F		3m	M6	A	6	250	A		F	134.2	P	1	5/0.8	5	F	134.2	T	1	5	5
												C	9.5				G	106	P	2	6.3/1.1	6.3	G	106	T	2	6.3	6.3
																	H	87.7	P	3	8/1.3	8	H	87.7	T	3	8	8
	C	A4	L									C	11		A		F	160.3	P	2	5/0.8	5	F	160.3	T	2	5	5
												D	15				H	104.7	P	4	8/1.3	8	H	104.7	T	4	8	8
1000	B	02	L	H	M		N	F		3m	M6	A	12	500	A		F	134.2	P	2	10/1.7	10	F	134.2	T	2	10	10
												C	19				G	106	P	2	12.5/2.1	12.5	G	106	T	2	12.5	12.5
																	H	87.7	P	3	16/2.7	16	H	87.7	T	3	16	16
	C	A2	L									C	22.5		B		F	160.3	P	2	10/1.7	10	F	160.3	T	2	10	10
												D	30				H	104.7	P	4	16/2.7	16	H	104.7	T	4	16	16
1250	B	04	L	H	M		N	F		3m	M6	A	6	313	A		F	134.2	P	1	5/0.8	6.3	F	134.2	T	1	5	6.3
												C	9.5				G	106	P	2	6.3/1.1	8	G	106	T	2	6.3	8
																	H	87.7	P	3	8/1.3	10	H	87.7	T	3	8	10
	C	A4	L									C	11		A		F	160.3	P	2	5/0.8	6.3	F	160.3	T	2	5	6.3
												D	15				H	104.7	P	4	8/1.3	10	H	104.7	T	4	8	10
1250	B	02	L	H	M		N	F		3m	M6	A	12	625	A		F	134.2	P	2	10/1.7	12.5	F	134.2	T	2	10	12.5
												C	19				G	106	P	2	12.5/2.1	16	G	106	T	2	12.5	16
																	H	87.7	P	3	16/2.7	20	H	87.7	T	3	16	20
	C	A2	L									C	22.5		B		F	160.3	P	2	10/1.7	12.5	F	160.3	T	2	10	12.5
												D	30				H	104.7	P	4	16/2.7	20	H	104.7	T	4	16	20
1600	B	02	L	H	M		N	F		2m	M5	A	12	800	A		F	134.2	P	2	10/1.7	16	F	134.2	T	2	10	16
												C	19				G	106	P	2	12.5/2.1	20	G	106	T	2	12.5	20
																	H	87.7	P	3	16/2.7	25.6	H	87.7	T	3	16	25.6
	C	A2	L									C	22.5		B		F	160.3	P	2	10/1.7	16	F	160.3	T	2	10	16
												D	30				H	104.7	P	4	16/2.7	26	H	104.7	T	4	16	26

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
1600	B	04	L	H	M		N	F		3m	M6	A	6	400	A		F	134.2	P 1	5/0.8	8	F	134.2	T	1	5	8
												C	9.5				G	106	P 2	6.3/1.1	10	G	106	T	2	6.3	10
																	H	87.7	P 3	8/1.3	12.8	H	87.7	T	3	8	12.8
	C	A4	L									C	11		A		F	160.3	P 2	5/0.8	8	F	160.3	T	2	5	8
												D	15				H	104.7	P 4	8/1.3	12.8	H	104.7	T	4	8	12.8
2000	Z	04	J							2m	M5	B	6	500	N		E	133.8	P X	4/0.7	8						
												C	9				G	79.1	O Z	6.7	13.4						
	B	04	L	H	M		N	F				A	6		A		F	134.2	P 1	5/0.8	10	F	134.2	T	1	5	10
												C	9.5				G	106	P 2	6.3/1.1	12.6	G	106	T	2	6.3	12.6
																	H	87.7	P 3	8/1.3	16	H	87.7	T	3	8	16
	C	A4	L									C	11		A		F	160.3	P 2	5/0.8	10	F	160.3	T	2	5	10
												D	15				H	104.7	P 4	8/1.3	16	H	104.7	T	4	8	16
2000	B	04	L	H	M		N	F		3m	M6	A	6	500	A		F	134.2	P 2	5/0.8	10	F	134.2	T	2	5	10
												C	9.5				G	106	P 2	6.3/1.1	12.6	G	106	T	2	6.3	12.6
																	H	87.7	P 3	8/1.3	16	H	87.7	T	3	8	16
	C	A4	L									C	11		A		F	160.3	P 2	5/0.8	10	F	160.3	T	2	5	10
												D	15				H	104.7	P 4	8/1.3	16	H	104.7	T	4	8	16
2500	B	04	L	H	M		N	F		3m	M6	A	6	625	A		F	134.2	P 2	5/0.8	12.5	F	134.2	T	2	5	12.5
												C	9.5				G	106	P 2	6.3/1.1	16	G	106	T	2	6.3	16
																	H	87.7	P 3	8/1.3	20	H	87.7	T	3	8	20
	C	A4	L									C	11		A		F	160.3	P 2	5/0.8	12.5	F	160.3	T	2	5	12.5
												D	15				H	104.7	P 4	8/1.3	20	H	104.7	T	4	8	20
3200	B	04	L	H	M		N	F		2m	M5	A	6	800	A		F	134.2	P 2	5/0.8	16	F	134.2	T	2	5	16
												C	9.5				G	106	P 2	6.3/1.1	20	G	106	T	2	6.3	20
																	H	87.7	P 3	8/1.3	25.6	H	87.7	T	3	8	25.6
	C	A4	L									C	11		A		F	160.3	P 2	5/0.8	16	F	160.3	T	2	5	16
												D	15				H	104.7	P 4	8/1.3	25.6	H	104.7	T	4	8	25.6
1000	C	M1							V	3m	M6	B	24	1000	F	*	F	160.3	P 3	20/3.3	20	F	160.3	T	3	20	20
												C	36				H	104.7	P 4	32/5.3	32	H	104.7	T	4	32	32
												D	48														
												E	62														
1000	C	M2							V	3m	M6	B	9.5	1000	B	*	F	160.3	P 3	20/3.3	20	F	160.3	T	3	20	20

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control						Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor		Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio			(m/min)		Type	Ratio			(m/min)	
												C	17				H	104.7	P	4	32/5.3	32	H	104.7	T	4	32	32
												D	25															
												E	34															
1250	C	M1							V	2m	M5	B	24	1250	F	*	F	160.3	P	3	20/3.3	25	F	160.3	T	3	20	25
												C	36				H	104.7	P	4	32/5.3	40	H	104.7	T	4	32	40
												D	48															
												E	62															
1250	C	M2							V	2m	M5	B	9.5	1250	B	*	F	160.3	P	3	20/3.3	25	F	160.3	T	3	20	25
												C	17				H	104.7	P	4	32/5.3	40	H	104.7	T	4	32	40
												D	25															
												E	34															
1600	C	M1							V	1Am	M4	B	24	1600	Y	*	E	192.6	P	3	16/2.7	26	E	192.6	T	3	16	26
												C	36															
												D	48															
												E	62															
1600	C	M2							V	1Am	M4	B	9.5	1600	B	*	E	192.6	P	3	16/2.7	26	E	192.6	T	3	16	26
												C	17															
												D	25															
												E	34															
1600	C	02	L	H	M		N	F		3m	M6	B	12	800	D		F	160.3	P	2	10/1.7	16	F	160.3	T	2	10	16
												C	18				H	104.7	P	4	16/2.7	26	H	104.7	T	4	16	26
												D	24		F													
				H	M		N	F				E	30		F													
2000	C	02	L	H	M		N	F		3m	M6	B	12	1000	D		F	160.3	P	3	10/1.7	20	F	160.3	T	3	10	20
												C	18				H	104.7	P	4	16/2.7	32	H	104.7	T	4	16	32
												D	24		F													
				H	M		N	F				E	30		F													
2500	C	02	L	H	M		N	F		2m	M5	B	12	1250	D		F	160.3	P	3	10/1.7	25	F	160.3	T	3	10	25
												C	18				H	104.7	P	4	16/2.7	40	H	104.7	T	4	16	40
												D	24		F													
				H	M		N	F				E	30		F													
3200	C	04	L	H	M		N	F		3m	M6	B	6	800	D		F	160.3	P	2	5/0.8	16	F	160.3	T	2	5	16
												C	9				H	104.7	P	4	8/1.3	26	H	104.7	T	4	8	26

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO						Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V			Code	HOL (m)	Load (kg)	Type		Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												D	12														
				H	M		N	F				E	15														
3200	C	02	L	H	M		N	F		1Am	M4	B	12	1600	D		E	192.6	P 3	8/1.3	26	E	192.6	T	3	8	26
												C	18														
												D	24		Y												
				H	M		N	F				E	30		Y												
4000	C	04	L	H	M		N	F		3m	M6	B	6	1000	D		F	160.3	P 3	5/0.8	20	F	160.3	T	3	5	20
												C	9				H	104.7	P 4	8/1.3	32	H	104.7	T	4	8	32
												D	12														
				H	M		N	F				E	15														
5000	C	04	L	H	M		N	F		2m	M5	B	6	1250	D		F	160.3	P 3	5/0.8	25	F	160.3	T	3	5	25
												C	9				H	104.7	P 4	8/1.3	40	H	104.7	T	4	8	40
												D	12														
				H	M		N	F				E	15														
6300	C	04	L	H	M			F		1Am	M4	B	6	1575	D		E	192.6	P 3	4/0.7	25	E	192.6	T	3	4	25
												C	9														
												D	12														
				H	M			F				E	15														
6000	C	06		H	M		N	F		3m	M6	C	6	1000	E		F	160.3	P 3	3.2/0.5	24	F	160.3	T	3	3.2	24
												D	8				H	104.7	P 4	5/0.8	38	H	104.7	T	4	5	38
												E	10														
7500	C	06		H	M		N	F		2m	M5	C	6	1250	E		F	160.3	P 3	3.2/0.5	24	F	160.3	T	3	3.2	24
												D	8				H	104.7	P 4	5/0.8	38	H	104.7	T	4	5	38
												E	10														
8000	C	08		H	M		N	F		2m	M5	C	4.5	1000	E		F	160.3	P 3	2.5/0.4	20	F	160.3	T	3	2.5	20
												D	6				H	104.7	P 4	4/0.7	32	H	104.7	T	4	4	32
												E	7.5														
10000	C	08		H	M		N	F		1Am	M4	C	4.5	1250	E		F	160.3	P 3	2.5/0.4	25	F	160.3	T	3	2.5	25
												D	6				H	104.7	P 4	4/0.7	40	H	104.7	T	4	4	40
												E	7.5														
2000	D	M1							V	3m	M6	D	36	2000	J	*	F	185.3	P 5	20/3.3	40	F	185.3	T	5	20	40
												E	48				H	113.8	P 6	32/5.3	64	H	113.8	T	6	32	64
												F	64				J	94.3	P 7	40/6.7	80	J	94.3	T	7	40	80

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												G	82														
2000	D	M2							V	3m	M6	D	18	2000	F	*	F	185.3	P 5	20/3.3	40	F	185.3	T 5		20	40
												E	27				H	113.8	P 6	32/5.3	64	H	113.8	T 6		32	64
												F	38				J	94.3	P 7	40/6.7	80	J	94.3	T 7		40	80
												G	50														
2500	D	M1							V	2m	M5	D	36	2500	J	*	F	185.3	P 5	20/3.3	50	F	185.3	T 5		20	50
												E	48				H	113.8	P 6	32/5.3	80	H	113.8	T 6		32	80
												F	64				J	94.3	P 7	40/6.7	100	J	94.3	T 7		40	100
												G	82														
2500	D	M2							V	2m	M5	D	18	2500	F	*	F	185.3	P 5	20/3.3	50	F	185.3	T 5		20	50
												E	27				H	113.8	P 6	32/5.3	80	H	113.8	T 6		32	80
												F	38				J	94.3	P 7	40/6.7	100	J	94.3	T 7		40	100
												G	50														
3150	D	M1							V	1Am	M4	D	36	3150	Z	*	E	223.8	P 5	16/2.7	50	E	223.8	T 5		16	50
												E	48														
												F	64														
												G	82														
3150	D	M2							V	1Am	M4	D	18	3150	Y	*	E	223.8	P 5	16/2.7	50	E	223.8	T 5		16	50
												E	27														
												F	38														
												G	50														
4000	D	02	L	H	M	W	N	F		3m	M6	D	18	2000	G		F	185.3	P 5	10/1.7	40	F	185.3	T 5		10	40
												E	24				H	113.8	P 6	16/2.7	64	H	113.8	T 6		16	64
												F	32		J		J	94.3	P 7	20/3.3	80	J	94.3	T 7		20	80
				H	M	W	N	F				G	40		J												
5000	D	02	L	H	M	W	N	F		2m	M5	D	18	2500	G		F	185.3	P 5	10/1.7	50	F	185.3	T 5		10	50
												E	24				H	113.8	P 6	16/2.7	80	H	113.8	T 6		16	80
												F	32		J		J	94.3	P 7	20/3.3	100	J	94.3	T 7		20	100
				H	M	W	N	F				G	40		J												
6300	D	02	L	H	M	W	N	F		1Am	M4	D	18	3100	G		E	223.8	P 5	8/1.3	50	E	223.8	T 5		8	50
												E	24														
												F	32		Z												
				H	M	W	N	F				G	40		Z												

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO						Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V			Code	HOL (m)	Load (kg)	Type		Type	Ratio		(m/min)		Type	Ratio			(m/min)	
6300	D	04	L	H	M	W	N	F		3m	M6	D	9	1600	G		F	185.3	P 5	5/0.8	38	F	185.3	T	5	5	38
												E	12				H	113.8	P 6	8/1.3	50	H	113.8	T	6	8	50
												F	16				J	94.3	P 7	10	63	J	94.3	T	7	10	63
				H	M	W	N	F				G	20														
8000	D	04	L	H	M	W	N	F		3m	M6	D	9	2000	G		F	185.3	P 5	5/0.8	40	F	185.3	T	5	5	40
												E	12				H	113.8	P 6	8/1.3	64	H	113.8	T	6	8	64
												F	16				J	94.3	P 7	10	80	J	94.3	T	7	10	80
				H	M	W	N	F				G	20														
10000	D	04	L	H	M	W	N	F		2m	M5	D	9	2500	G		F	185.3	P 5	5/0.8	50	F	185.3	T	5	5	50
												E	12				H	113.8	P 6	8/1.3	80	H	113.8	T	6	8	80
												F	16				J	94.3	P 7	10	100	J	94.3	T	7	10	100
				H	M	W	N	F				G	20														
12500	D	04	L	H	M	W		F		1Am	M4	D	9	3125	G		E	223.8	P 5	4/0.7	50	E	223.8	T	5	4	50
												E	12														
												F	16														
				H	M	W		F				G	20														
12000	D	06		H	M	W	N	F		3m	M6	D	6	2000	H		F	185.3	P 5	3.2/0.5	48	F	185.3	T	5	3.2	48
												E	8				H	113.8	P 6	5/0.8	75	H	113.8	T	6	5	75
												F	10				J	94.3	P 7	6.3/1.1	95	J	94.3	T	7	6.3	95
												G	13														
15000	D	06		H	M	W	N	F		2m	M5	D	6	2500	H		F	185.3	P 5	3.2/0.5	48	F	185.3	T	5	3.2	48
												E	8				H	113.8	P 6	5/0.8	75	H	113.8	T	6	5	75
												F	10				J	94.3	P 7	6.3/1.1	95	J	94.3	T	7	6.3	95
												G	13														
16000	D	08		H	M	W	N	F		2m	M5	D	4.5	2000	H		F	185.3	P 5	2.5/0.4	40	F	185.3	T	5	2.5	40
												E	6				H	113.8	P 6	4/0.7	64	H	113.8	T	6	4	64
												F	8				J	94.3	P 7	5/0.8	80	J	94.3	T	7	5	80
												G	10														
20000	D	08		H	M	W	N	F		1Am	M4	D	4.5	2500	H		F	185.3	P 5	2.5/0.4	50	F	185.3	T	5	2.5	50
												E	6				H	113.8	P 6	4/0.7	80	H	113.8	T	6	4	80
												F	8				J	94.3	P 7	5/0.8	100	J	94.3	T	7	5	100
												G	10														

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO						Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V			Code	HOL (m)	Load (kg)	Type		Type	Ratio		(m/min)		Type	Ratio			(m/min)	
4000	D	2 2	H	M	W	N	F			3m	M6	D	8.5	1000	D		F	185.3	P 5	10/1.7	40	F	185.3	T	5	10	40
												E	13	2000	+	*	H	113.8	P 6	16/2.7	64	H	113.8	T	6	16	64
												F	18		Dr		J	94.3	P 7	20/3.3	80	J	94.3	T	7	20	80
												G	25														
												H	33.5														
												J	46														
5000	D	22	H	M	W	N	F			2m	M5	D	8.5	1250	D		F	185.3	P 5	10/1.7	50	F	185.3	T	5	10	50
												E	13	2500	+	*	H	113.8	P 6	16/2.7	80	H	113.8	T	6	16	80
												F	18		Dr		J	94.3	P 7	20/3.3	100	J	94.3	T	7	20	100
												G	25														
												H	33.5														
												J	46														
6300	D	24	H	M	W	N	F			3m	M6	D	4	800	D		F	185.3	P 5	5/0.8	32	F	185.3	T	5	5	32
												E	6.5	1600	+	*	H	113.8	P 6	8/1.3	50	H	113.8	T	6	8	50
												F	9		Dr		J	94.3	P 7	10/1.7	63	J	94.3	T	7	10	63
												G	12.5														
												H	16.5														
												J	23														
8000	D	24	H	M	W	N	F			3m	M6	D	4	1000	D		F	185.3	P 5	5/0.8	40	F	185.3	T	5	5	40
												E	6.5	2000	+	*	H	113.8	P 6	8/1.3	64	H	113.8	T	6	8	64
												F	9		Dr		J	94.3	P 7	10/1.7	80	J	94.3	T	7	10	80
												G	12.5														
												H	16.5														
												J	23														
10000	D	24	H	M	W	N	F			2m	M5	D	4	1250	D		F	185.3	P 5	5/0.8	50	F	185.3	T	5	5	50
												E	6.5	2500	+	*	H	113.8	P 6	8/1.3	80	H	113.8	T	6	8	80
												F	9		Dr		J	94.3	P 7	10/1.7	100	J	94.3	T	7	10	100
												G	12.5														
												H	16.5														
												J	23														
12000	D	26	H	M	W	N	F			3m	M6	E	4	1000	E		F	185.3	P 5	3.2/0.5	38	F	185.3	T	5	3.2	38
												F	6	2000	+	*	H	113.8	P 6	5/0.8	60	H	113.8	T	6	5	60
												G	8		Er		J	94.3	P 7	6.3/1.1	76	J	94.3	T	7	6.3	76

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO						Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V			Code	HOL (m)	Load (kg)	Type		Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												H	11														
												J	15														
15000	D	26				H	M	W	N F	2m	M5	E	4	1250	E		F	185.3	P 5	3.2/0.5	48	F	185.3	T	5	3.2	48
												F	6	2500	+	*	H	113.8	P 6	5/0.8	75	H	113.8	T	6	5	75
												G	8		Er		J	94.3	P 7	6.3/1.1	95	J	94.3	T	7	6.3	95
												H	11														
												J	15														
16000	D	28				H	M	W	N F	2m	M5	F	4.5	1000	E		F	185.3	P 5	2.5/0.4	40	F	185.3	T	5	2.5	40
												G	6	2000	+	*	H	113.8	P 6	4/0.7	64	H	113.8	T	6	4	64
												H	8		Er		J	94.3	P 7	5/0.8	80	J	94.3	T	7	5	80
												J	11.5														
20000	D	28				H	M	W	N F	1Am	M4	F	4.5	1250	E		F	185.3	P 5	2.5/0.4	50	F	185.3	T	5	2.5	50
												G	6	2500	+	*	H	113.8	P 6	4/0.7	80	H	113.8	T	6	4	80
												H	8		Er		J	94.3	P 7	5/0.8	100	J	94.3	T	7	5	100
												J	11.5														
3200	E	M1							V	3m	M6	C	32	3200	M	*	E	344.9	P 6	16/2.7	51	E	344.9	T	6	16	51
												D	43				F	269.1	P 6	20/3.3	64	F	269.1	T	6	20	64
												E	56.5				G	223.1	P 7	25/4	80	G	223.1	T	7	25	80
												F	73									H	184.1	T	8	32	102
												G	94.5									J	143.6	T	9	40	128
												H	122.5														
												J	161.5														
												K	195														
3200	E	M2							V	3m	M6	E	37	3200	J	*	E	344.9	P 6	16/2.7	51	E	344.9	T	6	16	51
												F	48.5				F	269.1	P 6	20/3.3	64	F	269.1	T	6	20	64
												G	63				G	223.1	P 7	25/4	80	G	223.1	T	7	25	80
												H	82									H	184.1	T	8	32	102
												J	108.5									J	143.6	T	9	40	128
												K	131.5														
												L	158.5														
												M	177.5														
												N	200.5														

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
4000	E	M1							V	2m	M5	C	32	4000	M	*	E	344.9	P 6	16/2.7	64	E	344.9	T	6	16	64
												D	43				F	269.1	P 6	20/3.3	80	F	269.1	T	6	20	80
												E	56.5				G	223.1	P 7	25/4	100	G	223.1	T	7	25	100
												F	73									H	184.1	T	8	32	128
												G	94.5									J	143.6	T	9	40	160
												H	122.5														
												J	161.5														
												K	195														
4000	E	M2							V	2m	M5	E	37	4000	J	*	E	344.9	P 6	16/2.7	64	E	344.9	T	6	16	64
												F	48.5				F	269.1	P 6	20/3.3	80	F	269.1	T	6	20	80
												G	63				G	223.1	P 7	25/4	100	G	223.1	T	7	25	100
												H	82									H	184.1	T	8	32	128
												J	108.5									J	143.6	T	9	40	160
												K	131.5														
												L	158.5														
												M	177.5														
												N	200.5														
5000	E	M1							V	1Am	M4	C	32	5000	M	*	E	344.9	P 6	16/2.7	80	E	344.9	T	6	16	80
												D	43				F	269.1	P 7	20/3.3	100	F	269.1	T	7	20	100
												E	56.5				G	223.1	P 8	25/4	125	G	223.1	T	8	25	125
												F	73									H	184.1	T	9	32	160
												G	94.5									J	143.6	T	A	40	200
												H	122.5														
												J	161.5														
												K	195														
5000	E	M2							V	1Am	M4	E	37	5000	J	*	E	344.9	P 6	16/2.7	80	E	344.9	T	6	16	80
												F	48.5				F	269.1	P 7	20/3.3	100	F	269.1	T	7	20	100
												G	63				G	223.1	P 8	25/4	125	G	223.1	T	8	25	125
												H	82									H	184.1	T	9	32	160
												J	108.5									J	143.6	T	A	40	200
												K	131.5														
												L	158.5														
												M	177.5														

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												N	200.5														
6300	E	02			M		N	F		3m	M6	C	15.5	3150	K		E	344.9	P	6	8/1.3	50	E	344.9	T	6	8	50
												D	21				F	269.1	P	6	10/1.7	63	F	269.1	T	6	10	63
												E	28		M		G	223.1	P	7	12.5/2.1	79	G	223.1	T	7	12.5	79
												F	36		M								H	184.1	T	8	16	101
												G	47		M								J	143.6	T	9	20	126
												H	61		M												
												J	80.5		M												
												K	97		M												
8000	E	02			M		N	F		2m	M5	C	15.5	4000	K		E	344.9	P	6	8/1.3	64	E	344.9	T	6	8	64
												D	21				F	269.1	P	6	10/1.7	80	F	269.1	T	6	10	80
												E	28		M		G	223.1	P	7	12.5/2.1	100	G	223.1	T	7	12.5	100
												F	36		M								H	184.1	T	8	16	128
												G	47		M								J	143.6	T	9	20	160
												H	61		M												
												J	80.5		M												
												K	97		M												
10000	E	02			M		N	F		1Am	M4	C	15.5	5000	K		E	344.9	P	6	8/1.3	80	E	344.9	T	6	8	80
												D	21				F	269.1	P	7	10/1.7	100	F	269.1	T	7	10	100
												E	28		M		G	223.1	P	8	12.5/2.1	125	G	223.1	T	8	12.5	125
												F	36		M								H	184.1	T	9	16	160
												G	47		M								J	143.6	T	A	20	200
												H	61		M												
												J	80.5		M												
												K	97		M												
12500	E	04			M		N	F		3m	M6	C	7.5	3125	K		E	344.9	P	6	4/0.7	50	E	344.9	T	6	4	50
												D	10.5				F	269.1	P	6	5/0.8	63	F	269.1	T	6	5	63
												E	14				G	223.1	P	7	6.3/1.1	79	G	223.1	T	7	6.3	79
												F	18										H	184.1	T	8	8	100
												G	23.5										J	143.6	T	9	10	125
												H	30.5														
												J	40														
												K	48.5														

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
16000	E	04			M		N	F		2m	M5	C	7.5	4000	K		E	344.9	P 6	4/0.6	64	E	344.9	T	6	4	64
												D	10.5				F	269.1	P 6	5/0.8	80	F	269.1	T	6	5	80
												E	14				G	223.1	P 7	6.3/1.1	101	G	223.1	T	7	6.3	101
												F	18									H	184.1	T	8	8	128
												G	23.5									J	143.6	T	9	10	160
												H	30.5														
												J	40														
												K	48.5														
20000	E	04			M		N	F		1Am	M4	C	7.5	5000	K		E	344.9	P 6	4/0.6	80	E	344.9	T	6	4	80
												D	10.5				F	269.1	P 7	5/0.8	100	F	269.1	T	7	5	100
												E	14				G	223.1	P 8	6.3/1.1	126	G	223.1	T	8	6.3	126
												F	18									H	184.1	T	9	8	160
												G	23.5									J	143.6	T	A	10	200
												H	30.5														
												J	40														
												K	48.5														
20000	E	06			M		N	F		3m	M6	C	5	3340	L		E	344.9	P 6	2.5/0.4	50	E	344.9	T	6	2.5	50
												D	7				F	269.1	P 6	3.2/0.5	64	F	269.1	T	6	3.2	64
												E	9				G	223.1	P 7	4/0.7	80	G	223.1	T	7	4	80
												F	12									H	184.1	T	8	5	100
												G	15.5									J	143.6	T	9	6.3	126
												H	20														
												J	26.5														
												K	32														
25000	E	06			M		N	F		2m	M5	C	5	4170	L		E	344.9	P 6	2.5/0.4	63	E	344.9	T	6	2.5	63
												D	7				F	269.1	P 6	3.2/0.5	80	F	269.1	T	6	3.2	80
												E	9				G	223.1	P 7	4/0.7	100	G	223.1	T	7	4	100
												F	12									H	184.1	T	8	5	125
												G	15.5									J	143.6	T	9	6.3	158
												H	20														
												J	26.5														
												K	32														
30000	E	06			M		N	F		1Am	M4	C	5	5000	L		E	344.9	P 6	2.5/0.4	75	E	344.9	T	6	2.5	75

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												D	7				F	269.1	P 7	3.2/0.5	96	F	269.1	T	7	3.2	96
												E	9				G	223.1	P 8	4/0.7	120	G	223.1	T	8	4	120
												F	12									H	184.1	T	9	5	150
												G	15.5									J	143.6	T	A	6.3	189
												H	20														
												J	26.5														
												K	32														
32000	E	08			M		N	F		2m	M5	E	7	4000	L		E	344.9	P 6	2/0.3	64	E	344.9	T	6	2	64
												F	9				F	269.1	P 7	2.5/0.4	80	F	269.1	T	7	2.5	80
												G	11.5									G	223.1	T	8	3.2	102
												H	15									H	184.1	T	9	4	128
												J	20									J	143.6	T	A	5	160
												K	24														
40000	E	08			M		N	F		1Am	M4	E	7	5000	L		E	344.9	P 6	2/0.3	80	E	344.9	T	6	2	80
												F	9				F	269.1	P 7	2.5/0.4	100	F	269.1	T	7	2.5	100
												G	11.5				G	223.1	P 8	3.2/0.5	128	G	223.1	T	8	3.2	128
												H	15									H	184.1	T	9	4	160
												J	20									J	143.6	T	A	5	200
												K	24														
6300	E	22			M		N	F		3m	M6	E	16.5	1575	G		E	344.9	P 6	8/1.3	50	E	344.9	T	6	8	50
												F	22	3200	+	*	F	269.1	P 6	10/1.7	63	F	269.1	T	6	10	63
												G	29.5		Gr		G	223.1	P 7	12.5/2.1	79	G	223.1	T	7	12.5	79
												H	39									H	184.1	T	8	16	101
												J	52									J	143.6	T	9	20	126
												K	63.5														
												L	77														
												M	86.5														
												N	98														
8000	E	22			M		N	F		2m	M5	E	16.5	2000	G		E	344.9	P 6	8/1.3	64	E	344.9	T	6	8	64
												F	22	4000	+	*	F	269.1	P 6	10/1.7	80	F	269.1	T	6	10	80
												G	29.5		Gr		G	223.1	P 7	12.5/2.1	100	G	223.1	T	7	12.5	100
												H	39									H	184.1	T	8	16	128
												J	52									J	143.6	T	9	20	160

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control						Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor		Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio			(m/min)		Type	Ratio			(m/min)	
												K	63.5															
												L	77															
												M	86.5															
												N	98															
10000	E	22			M		N	F		1Am	M4	E	16.5	2500	G		E	344.9	P	6	8/1.3	80	E	344.9	T	6	8	80
												F	22	5000	+	*	F	269.1	P	7	10/1.7	100	F	269.1	T	7	10	100
												G	29.5		Gr		G	223.1	P	8	12.5/2.1	125	G	223.1	T	8	12.5	125
												H	39										H	184.1	T	9	16	160
												J	52										J	143.6	T	A	20	200
												K	63.5															
												L	77															
												M	86.5															
												N	98															
12500	E	24			M		N	F		3m	M6	E	8	1600	G		E	344.9	P	6	4/0.7	50	E	344.9	T	6	4	50
												F	11	3200	+	*	F	269.1	P	6	5/0.8	63	F	269.1	T	6	5	63
												G	14.5		Gr		G	223.1	P	7	6.3/1.1	79	G	223.1	T	7	6.3	79
												H	19.5										H	184.1	T	8	8	100
												J	26										J	143.6	T	9	10	125
												K	31.5															
												L	38.5															
												M	43															
												N	49															
16000	E	24			M		N	F		2m	M5	E	8	2000	G		E	344.9	P	6	4/0.7	64	E	344.9	T	6	4	64
												F	11	4000	+	*	F	269.1	P	6	5/0.8	80	F	269.1	T	6	5	80
												G	14.5		Gr		G	223.1	P	7	6.3/1.1	101	G	223.1	T	7	6.3	101
												H	19.5										H	184.1	T	8	8	128
												J	26										J	143.6	T	9	10	160
												K	31.5															
												L	38.5															
												M	43															
												N	49															
20000	E	24			M		N	F		1Am	M4	E	8	2500	G		E	344.9	P	6	4/0.6	80	E	344.9	T	6	4	80
												F	11	5000	+	*	F	269.1	P	7	5/0.8	100	F	269.1	T	7	5	100

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												G	14.5		Gr		G	223.1	P 8	6.3/1.1	126	G	223.1	T	8	6.3	126
												H	19.5									H	184.1	T	9	8	160
												J	26									J	143.6	T	A	10	200
												K	31.5														
												L	38.5														
												M	43														
												N	49														
20000	E	26			M		N	F		3m	M6	E	5.5	1670	H		E	344.9	P 6	2.5/0.4	63	E	344.9	T	6	2.5	63
												F	7	3340	+	*	F	269.1	P 6	3.2/0.5	80	F	269.1	T	6	3.2	80
												G	9.5		Hr		G	223.1	P 7	4/0.7	100	G	223.1	T	7	4	100
												H	13									H	184.1	T	8	5	125
												J	17									J	143.6	T	9	6.3	158
												K	21														
												L	25.5														
												M	28.5														
												N	32.5														
25000	E	26			M		N	F		2m	M5	E	5.5	2085	H		E	344.9	P 6	2.5/0.4	63	E	344.9	T	6	2.5	63
												F	7	4200	+	*	F	269.1	P 6	3.2/0.5	80	F	269.1	T	6	3.2	80
												G	9.5		Hr		G	223.1	P 7	4/0.7	100	G	223.1	T	7	4	100
												H	13									H	184.1	T	8	5	125
												J	17									J	143.6	T	9	6.3	158
												K	21														
												L	25.5														
												M	28.5														
												N	32.5														
30000	E	26			M		N	F		1Am	M4	E	5.5	2500	H		E	344.9	P 6	2.5/0.4	75	E	344.9	T	6	2.5	75
												F	7	5000	+	*	F	269.1	P 7	3.2/0.5	96	F	269.1	T	7	3.2	96
												G	9.5		Hr		G	223.1	P 8	4/0.7	120	G	223.1	T	8	4	120
												H	13									H	184.1	T	9	5	150
												J	17									J	143.6	T	A	6.3	189
												K	21														
												L	25.5														
												M	28.5														

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												N	32.5														
32000	E	28			M		N	F		2m	M5	F	5.5	2000	H		E	344.9	P 6	2/0.3	80	E	344.9	T	6	2	64
												G	7	4000	+	*	F	269.1	P 7	2.5/0.4	100	F	269.1	T	7	2.5	80
												H	9.5		Hr							G	223.1	T	8	3.2	102
												J	13									H	184.1	T	9	4	128
												K	15.5									J	143.6	T	A	5	160
												L	19														
												M	21.5														
												N	24.5														
40000	E	28			M		N	F		1Am	M4	F	5.5	2500	H		E	344.9	P 6	2/0.3	80	E	344.9	T	6	2	80
												G	7	5000	+	*	F	269.1	P 7	2.5/0.4	100	F	269.1	T	7	2.5	100
												H	9.5		Hr		G	223.1	P 8	3.2/0.5	128	G	223.1	T	8	3.2	128
												J	13									H	184.1	T	9	4	160
												K	15.5									J	143.6	T	A	5	200
												L	19														
												M	21.5														
												N	24.5														
12500	F	22			M			F		3m	M6	F	15.5	3125	K		E	344.9	2P 6	8/1.2	100	E	344.9	2T	6	8	100
												G	20.5	6300	+	*	F	269.1	2P 6	10/1.6	125	F	269.1	2T	6	10	125
												H	27.5		Kr		G	223.1	2P 7	12.5/2.1	157	G	223.1	2T	7	12.5	157
												J	37.5									H	184.1	2T	8	16	200
												K	46									J	143.6	2T	9	20	250
												L	55.5														
												M	62.5														
												N	71														
16000	F	22			M			F		2m	M5	F	15.5	4000	K		E	344.9	2P 6	8/1.2	128	E	344.9	2T	6	8	128
												G	20.5	8000	+	*	F	269.1	2P 6	10/1.6	160	F	269.1	2T	6	10	160
												H	27.5		Kr		G	223.1	2P 7	12.5/2.1	200	G	223.1	2T	7	12.5	200
												J	37.5									H	184.1	2T	8	16	250
												K	46									J	143.6	2T	9	20	320
												L	55.5														
												M	62.5														

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												N	71														
20000	F	22			M			F		1Am	M4	F	15.5	5000	K		E	344.9	2P 6	8/1.2	160	E	344.9	2T	6	8	160
												G	20.5	10000	+	*	F	269.1	2P 7	10/1.6	200	F	269.1	2T	7	10	200
												H	27.5		Kr							G	223.1	2T	8	12.5	250
												J	37.5									H	184.1	2T	9	16	320
												K	46														
												L	55.5														
												M	62.5														
												N	71														
25000	F	24			M			F		3m	M6	F	7.5	3125	K		E	344.9	2P 6	4/0.6	100	E	344.9	2T	6	4	100
												G	10	6300	+	*	F	269.1	2P 6	5/0.8	125	F	269.1	2T	6	5	125
												H	13.5		Kr		G	223.1	2P 7	6.3/1	158	G	223.1	2T	7	6.3	158
												J	18.5									H	184.1	2T	8	8	200
												K	23									J	143.6	2T	9	10	250
												L	27.5														
												M	31														
												N	35.5														
32000	F	24			M			F		2m	M5	F	7.5	4000	K		E	344.9	2P 6	4/0.6	128	E	344.9	2T	6	4	128
												G	10	8000	+	*	F	269.1	2P 6	5/0.8	160	F	269.1	2T	6	5	160
												H	13.5		Kr		G	223.1	2P 7	6.3/1	202	G	223.1	2T	7	6.3	202
												J	18.5									H	184.1	2T	8	8	250
												K	23									J	143.6	2T	9	10	320
												L	27.5														
												M	31														
												N	35.5														
40000	F	24			M			F		1Am	M4	F	7.5	5000	K		E	344.9	2P 6	4/0.6	160	E	344.9	2T	6	4	160
												G	10	10000	+	*	F	269.1	2P 7	5/0.8	200	F	269.1	2T	7	5	200
												H	13.5		Kr							G	223.1	2T	8	6.3	250
												J	18.5									H	184.1	2T	9	8	320
												K	23														
												L	27.5														
												M	31														
												N	35.5														

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control						Inverter control						
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor		Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio			(m/min)		Type	Ratio			(m/min)	
40000	F	26			M			F		3m	M6	F	5	3333	L		E	344.9	2P	6	2.5/0.4	100	E	344.9	2T	6	2.5	100
												G	6.5	6667	+	*	F	269.1	2P	6	3.2/0.5	128	F	269.1	2T	6	3.2	128
												H	9		Lr		G	223.1	2P	7	4/0.6	160	G	223.1	2T	7	4	160
												J	12.5										H	184.1	2T	8	5	200
												K	15										J	143.6	2T	9	6.3	250
												L	18.5															
												M	20.5															
												N	23.5															
50000	F	26			M			F		2m	M5	F	5	4167	L		E	344.9	2P	6	2.5/0.4	125	E	344.9	2T	6	2.5	125
												G	6.5	8300	+	*	F	269.1	2P	6	3.2/0.5	160	F	269.1	2T	6	3.2	160
												H	9		Lr		G	223.1	2P	7	4/0.6	200	G	223.1	2T	7	4	200
												J	12.5										H	184.1	2T	8	5	250
												K	15										J	143.6	2T	9	6.3	315
												L	18.5															
												M	20.5															
												N	23.5															
60000	F	26			M			F		1Am	M4	F	5	5000	L		E	344.9	2P	6	2.5/0.4	150	E	344.9	2T	6	2.5	150
												G	6.5	10000	+	*	F	269.1	2P	7	3.2/0.5	192	F	269.1	2T	7	3.2	192
												H	9		Lr								G	223.1	2T	8	4	240
												J	12.5										H	184.1	2T	9	5	300
												K	15															
												L	18.5															
												M	20.5															
												N	23.5															
63000	F	28			M			F		2m	M5	H	6.5	3978	L		E	344.9	2P	6	2/0.3	126	E	344.9	2T	6	2	126
												J	9	7875	+	*	F	269.1	2P	6	2.5/0.4	158	F	269.1	2T	6	2.5	158
												K	11		Lr		G	223.1	2P	7	3.2/0.5	200	G	223.1	2T	7	3.2	200
												L	13.5										H	184.1	2T	8	4	250
												M	15.5										J	143.6	2T	9	5	315
												N	17.5															
80000	F	28			M			F		1Am	M4	H	6.5	5000	L		E	344.9	2P	6	2/0.3	160	E	344.9	2T	6	2	160
												J	9	10000	+	*	F	269.1	2P	7	2.5/0.4	200	F	269.1	2T	7	2.5	200
												K	11		Lr								G	223.1	2T	8	3.2	250

Load (kg)	Frame	Falls	Trolley							Duty		Drum		Rope		*)Drum	Contactor control					Inverter control					
				D	D	D				FEM	ISO	Code	HOL	Load	Type		Gear		Motor	Speed	(tm/min)	Gear		Motor		Speed	(tm/min)
			L	H	M	W	N	F	V				(m)	(kg)			Type	Ratio		(m/min)		Type	Ratio			(m/min)	
												L	13.5									*H*	184.1	*2T*	*9*	4	320
												M	15.5														
												N	17.5														

*) Drum load

3 HOISTING MOTORS

3.1 Motor data, 2 - speed pole change motors, 50 Hz

Duty Group Fem/ISO	Q motor data			PX		P1		P2		P3	
				MF09ZA106		MF10M-106		MF10Z-106		MF10X-106	
		Rated power	kW	1.5	0.25	1.8	0.25	3.6	0.5	4.5	0.7
		Synchronous speed	RPM	3000	500	3000	500	3000	500	3000	500
		Brake torque	Nm	14		21		21		42	
		Max el. br. torque	Nm		-		32		63		77
		El. br. torque	Nm		-		12.6		25		38
		Power fact. start		0.89	0.77	0.8	0.83	0.83	0.78	0.84	0.77
		Starting torque	Nm	11	10	12.4	10.7	25	22	34	28
		Weight	kg	21		22.6		30.6		35	
		Brake inertia	kgm^2	0.00017		0.00017		0.00017		0.00045	
		Inertia w/o brake	kgm^2	0.0039		0.0027		0.0049		0.0059	
2m/M5		Load	tm/min	8 *)		10		20		25	
240	300	Nominal power	kW	1.5	0.25	1.8	0.25	3.6	0.5	4.5	0.7
Starts/h	starts/h	Nominal torque	Nm	5.4	5.4	6.1	6.1	12.3	12.3	15.3	15.3
40 % ED	60 % ED	Nominal speed	RPM	2750	400	2780	420	2800	400	2750	415
30/3.5 min		Short time duty	min	30	15	60	15	60	15	30	15
		Power factor		0.88	0.66	0.82	0.67	0.87	0.63	0.92	0.61
		Efficiency		0.66	0.23	0.66	0.24	0.73	0.30	0.72	0.30
3m/M6		Load	tm/min			8		16		20	
300	300	Nominal power	kW			1.5	0.2	2.9	0.4	3.6	0.5
Starts/h	starts/h	Nominal torque	Nm			4.9	4.9	9.8	9.8	12.3	12.3
50 % ED	60 % ED	Nominal speed	RPM			2830	435	2850	420	2830	430
30/4 min		Short time duty	min								
		Power factor				0.78	0.64	0.84	0.58	0.89	0.56
		Efficiency				0.64	0.22	0.76	0.29	0.74	0.29
		Load	tm/min			6.3		12.5		16	
	300	Nominal power	kW			1.2	0.16	2.4	0.35	2.9	0.4
	starts/h	Nominal torque	Nm			3.9	3.9	7.7	7.7	9.8	9.8
	60 % ED	Nominal speed	RPM			2860	445	2890	435	2870	440
		Short time duty	min								
		Power factor				0.73	0.61	0.77	0.53	0.85	0.51
		Efficiency				0.61	0.18	0.75	0.26	0.73	0.27
		Load	tm/min			5		10		12.5	
	300	Nominal power	kW			0.9	0.12	1.8	0.25	2.4	0.35
	starts/h	Nominal torque	Nm			3	3	6.1	6.1	7.7	7.7
	60 % ED	Nominal speed	RPM			2890	460	2920	450	2900	450
		Short time duty	min								
		Power factor				0.66	0.58	0.69	0.50	0.81	0.48
		Efficiency				0.58	0.15	0.73	0.23	0.72	0.24

*) Q motor data for PX 240 starts/h, 40% ED

☞ For Duty Group 1Am/M4 use the motor values of Duty Group 2m/M5.

Duty Group Fem/ISO	Q motor data			P4 MF11XA106		P5 MF11X-106		P6 MF13Z-106		P7 MF13X-106	
		Rated power	kW	7.5	1.2	9	1.4	15	2.5	18	3
		Synchronous speed	RPM	3000	500	3000	500	3000	500	3000	500
		Brake torque	Nm	54		54		100		130	
		Max el. br. torque	Nm		105		107		190		225
		El. br. torque	Nm		56		57		84		111
		Power fact. start		0.79	0.69	0.77	0.69	0.67	0.68	0.62	0.65
		Starting torque	Nm	57	48	67	56	107	84	120	111
		Weight	kg	51		59		86		99	
		Brake inertia	kgm^2	0.0007		0.0007		0.0007		0.0017	
		Inertia w/o brake	kgm^2	0.0101		0.0116		0.036		0.043	
2m/M5		Load	tm/min	40		50		80		100	
240	300	Nominal power	kW	7.5	1.2	9	1.4	15	2.5	18	3
starts/h	starts/h	Nominal torque	Nm	24	24	30	30	48	48	62	62
40 % ED	60 % ED	Nominal speed	RPM	2650	355	2680	335	2740	420	2770	425
30/3.5 min		Short time duty	min	30	12	30	10	30	15	30	15
		Power factor		0.90	0.56	0.90	0.61	0.87	0.59	0.91	0.56
		Efficiency		0.73	0.28	0.72	0.28	0.78	0.45	0.80	0.47
3m/M6		Load	tm/min	32		40		63		80	
300	300	Nominal power	kW	6	1	7.5	1.2	12	2	15	2.5
starts/h	starts/h	Nominal torque	Nm	19.2	19.2	24	24	38	38	48	48
50 % ED	60 % ED	Nominal speed	RPM	2730	390	2760	370	2810	440	2820	440
30/4 min		Short time duty	min								
		Power factor		0.87	0.52	0.87	0.56	0.82	0.52	0.89	0.47
		Efficiency		0.74	0.27	0.79	0.28	0.80	0.43	0.82	0.43
		Load	tm/min	25		32		50		63	
	300	Nominal power	kW	4.5	0.7	6	1	9	1.4	12	2
	starts/h	Nominal torque	Nm	15.3	15.3	19.2	19.2	30	30	38	38
	60 % ED	Nominal speed	RPM	2800	420	2820	400	2860	455	2865	455
		Short time duty	min								
		Power factor		0.82	0.47	0.84	0.52	0.78	0.48	0.87	0.41
		Efficiency		0.75	0.26	0.79	0.28	0.80	0.41	0.82	0.40
		Load	tm/min	20		25		40		50	
	300	Nominal power	kW	3.6	0.5	4.5	0.7	7.5	1.2	9	1.4
	starts/h	Nominal torque	Nm	12.3	12.3	15.3	15.3	24	24	30	30
	60 % ED	Nominal speed	RPM	2840	440	2870	425	2900	465	2900	465
		Short time duty	min								
		Power factor		0.76	0.45	0.80	0.47	0.70	0.42	0.84	0.36
		Efficiency		0.74	0.23	0.79	0.25	0.77	0.34	0.82	0.35

☞ For Duty Group 1Am/M4 use the motor values of Duty Group 2m/M5.

Duty Group Fem/ISO	Q motor data			P8*	
				MF13XA106	
		Rated power	kW	23	3.5
		Synchronous speed	RPM	3000	500
		Brake torque	Nm	200	
		Max el. br. torque	Nm		290
		El. br. torque	Nm		150
		Power fact. start		0.73	0.67
		Starting torque	Nm	165	140
		Weight	kg	99	
		Brake inertia	kgm^2	0.0017	
		Inertia w/o brake	kgm^2	0.043	
1Am/M4		Load	tm/min	125	
180	300	Nominal power	kW	23	3.5
starts/h	starts/h	Nominal torque	Nm	76	76
30 % ED	50 % ED	Nominal speed	RPM	2790	420
15/3 min		Short time duty	min	15	10
		Power factor		0.84	0.57
		Efficiency		0.83	0.44

*) Note! P8 hoisting motor for 1Am use only. External fan as standard.

3.2 Motor currents, 2 - speed pole change motors, 50 Hz

				Currents							
		Nominal voltage		230 V		400 V		500 V		660 V	
		Used in voltage range		220…240 V		380…415 V		500…525 V		660…690 V	
			tm/min	fast	slow	fast	slow	fast	slow	fast	slow
PX	Starting current	(A)				15	3.0				
MF09ZA106	Nominal current	(A)									
			8			3.7	2.2				
	No-load current	(A)				2.1	2.1				
P1	Starting current	(A)		35	6.1	20	3.6	16	2.9	12	2.2
MF10M-106	Nominal current	(A)									
			10	8.5	4.9	4.9	2.8	3.9	2.2	3.0	1.7
			8	7.5	4.3	4.3	2.5	3.4	2.0	2.6	1.5
			6.3	7.0	4.3	4	2.5	3.2	2.0	2.4	1.5
			5	6.6	4.3	3.8	2.5	3.0	2.0	2.3	1.5
	No-load current	(A)		6.3	4.9	3.6	2.8	2.9	2.2	2.2	1.7
P2	Starting current	(A)		68	11.7	39	6.7	31	5.4	24	4.1
MF10Z-106	Nominal current	(A)									
			20	14	7.1	8.2	4.1	6.6	3.3	5.0	2.5
			16	12.2	6.6	7	3.8	5.6	3.0	4.2	2.3
			12.5	10.4	6.4	6	3.7	4.8	3.0	3.6	2.2
			10	9.2	6.6	5.3	3.8	4.2	3.0	3.2	2.3
	No-load current	(A)		7.8	7.5	4.5	4.3	3.6	3.4	2.7	2.6
P3	Starting current	(A)		77	15	44	8.6	35	6.9	27	5.2
MF10X-106	Nominal current	(A)									
			25	17	9.6	9.9	5.5	7.9	4.4	6.0	3.3
			20	14.6	8.7	8.4	5	6.7	4.0	5.1	3.0
			16	12.2	8.7	7	5	5.6	4.0	4.2	3.0
			12.5	10.6	8.9	6.1	5.1	4.9	4.1	3.7	3.1
	No-load current	(A)		7.7	9.6	4.4	5.5	3.5	4.4	2.7	3.3
P4	Starting current	(A)		118	22	68	12.7	54	10.2	41	7.7
MF11XA106	Nominal current	(A)									
			40	30	17	17	9.5	14	7.6	10	5.8
			32	24	15	13.7	8.6	11.0	6.9	8.3	5.2
			25	19	15	11	8.6	8.8	6.9	6.7	5.2
			20	17	15	10	8.6	8.0	6.9	6.1	5.2
	No-load current	(A)		12	16	7.0	9.2	5.6	7.4	4.2	5.6
P5	Starting current	(A)		144	28	83	16	66	12.8	50	9.7
MF11X-106	Nominal current										
			50	33	19	19	11	15	8.8	12	6.7
			40	28	16	16	9	13	7.2	9.9	5.5
			32	23	15	13.5	8.9	10.8	7.1	8.2	5.4
			25	19	15	11.1	8.9	8.9	7.1	6.7	5.4
	No-load current	(A)		14	17	7.8	10	6.2	8.0	4.7	6.1
P6	Starting current	(A)		252	43	145	25	116	20	88	15
MF13Z-106	Nominal current	(A)									
			80	56	24	32	14	26	11	19	8.5
			63	43	21	25	12	20	9.6	15	7.3
			50	38	21	22	12	18	9.6	13	7.3
			40	35	21	20	12	16	9.6	12	7.3
	No-load current	(A)		28	23	16	13	13	10.4	9.7	7.9
P7	Starting current	(A)		339	59	195	34	156	27.2	118	21
MF13X-106	Nominal current	(A)									
			100	66	31	38	18	30	14	23	11
			80	49	26	28	15	22	12.0	17	9.1
			63	40	26	23	15	18	12.0	14	9.1

				Currents							
			Nominal voltage	230 V		400 V		500 V		660 V	
			Used in voltage range	220…240 V		380…415 V		500…525 V		660…690 V	
			tm/min	fast	slow	fast	slow	fast	slow	fast	slow
			50	33	26	19	15	15	12.0	11.5	9.1
	No-load current	(A)		21	31	12	18	9.6	14.4	7.3	10.9
P8	Starting current	(A)		389	68	212	39	170	31	128	24
MF13XA106	Nominal current	(A)									
			125	85	40	49	23	39	18	30	14
	No-load current	(A)		43	38	25	22	20	18	15	13

3.3 Motor data, 2 - speed pole change motors, 60 Hz

Duty Group Fem/ISO	Q motor data			PX		P1		P2		P3	
				MF09ZA106		MF10M-106		MF10Z-106		MF10X-106	
		Rated power	kW	1.8	0.3	2.2	0.3	4.3	0.7	5.4	0.9
		Synchronous speed	RPM	3600	600	3600	600	3600	600	3600	600
		Brake torque	Nm	14		21		21		42	
		Max el. br. torque	Nm		-		32		63		77
		El. br. torque	Nm		-		12.6		25		38
		Power fact. start		0.87	0.73	0.76	0.81	0.77	0.73	0.78	0.74
		Starting torque	Nm	11	10	12.4	10.7	24.6	21.7	34	28
		Weight	kg	21		22.6		30.6		35	
		Brake inertia	kgm^2	0.00012		0.00017		0.00017		0.00045	
		Inertia w/o brake	kgm^2	0.0039		0.0027		0.0049		0.0059	
2m/M5		Load	tm/min	9.6 *)		12		24		30	
240	300	Nominal power	kW	1.8	0.3	2.2	0.3	4.3	0.7	5.4	0.9
starts/h	starts/h	Nominal torque	Nm	5.4	5.4	6.1	6.1	12.3	12.3	15.3	15.3
40 % ED	60 % ED	Nominal speed	RPM	3350	500	3410	525	3400	500	3350	495
30/3.5 min		Short time duty	min	30	15	60	15	60	15	30	15
		Power factor		0.90	0.68	0.83	0.65	0.89	0.61	0.93	0.60
		Efficiency		0.68	0.25	0.71	0.28	0.75	0.38	0.74	0.36
3m/M6		Load	tm/min			9.6		19.2		24	
300	300	Nominal power	kW			1.8	0.25	3.5	0.5	4.3	0.7
starts/h	starts/h	Nominal torque	Nm			4.9	4.9	9.8	9.8	12.3	12.3
50 % ED	60 % ED	Nominal speed	RPM			3450	540	3450	520	3410	530
30/4 min		Short time duty	min								
		Power factor				0.80	0.58	0.87	0.54	0.91	0.53
		Efficiency				0.71	0.25	0.75	0.36	0.75	0.34
		Load	tm/min			7.6		15		19.2	
	300	Nominal power	kW			1.4	0.2	2.9	0.4	3.5	0.5
	starts/h	Nominal torque	Nm			3.9	3.9	7.7	7.7	9.8	9.8
	60 % ED	Nominal speed	RPM			3480	550	3490	540	3450	540
		Short time duty	min								
		Power factor				0.75	0.55	0.82	0.49	0.88	0.49
		Efficiency				0.68	0.21	0.74	0.31	0.75	0.31
		Load	tm/min			6		12		15	
	300	Nominal power	kW			1.1	0.15	2.2	0.3	2.9	0.4
	starts/h	Nominal torque	Nm			3	3	6.1	6.1	7.7	7.7
	60 % ED	Nominal speed	RPM			3510	565	3520	550	3490	550
		Short time duty	min								
		Power factor				0.67	0.52	0.76	0.45	0.85	0.45
		Efficiency				0.66	0.18	0.71	0.28	0.73	0.28

*) Q motor data for PX 240 starts/h, 40% ED

☞ For Duty Group 1Am/M4 use the motor values of Duty Group 2m/M5.

Duty Group Fem/ISO	Q motor data			P4		P5		P6		P7	
				MF11XA106		MF11X-106		MF13Z-106		MF13X-106	
		Rated power	kW	9	1.4	11	1.6	18	3	21	3.5
		Synchronous speed	RPM	3600	600	3600	600	3600	600	3600	600
		Brake torque	Nm	54		54		100		130	
		Max el. br. torque	Nm		105		112		182		205
		El. br. torque	Nm		56		64		82		101
		Power fact. start		0.73	0.67	0.75	0.68	0.60	0.64	0.55	0.59
		Starting torque	Nm	54	44	63	51	102	82	114	101
		Weight	kg	51		59		86		99	
		Brake inertia	kgm2	0.0007		0.0007		0.0007		0.0017	
		Inertia w/o brake	kgm2	0.0101		0.0116		0.036		0.043	
2m/M5		Load	tm/min	48		60		96		120	
240	300	Nominal power	kW	9	1.4	11	1.6	18	3	21	3.5
starts/h	starts/h	Nominal torque	Nm	24	24	30	30	48	48	62	62
40 % ED	60 % ED	Nominal speed	RPM	3230	450	3250	440	3320	515	3360	520
30/3.5 min		Short time duty	min	30	12	30	10	30	15	30	15
		Power factor		0.90	0.54	0.91	0.57	0.88	0.59	0.92	0.55
		Efficiency		0.74	0.34	0.75	0.35	0.80	0.50	0.81	0.52
3m/M6		Load	tm/min	38		48		76		96	
300	300	Nominal power	kW	7.2	1.2	9	1.4	14	2.3	18	3
starts/h	starts/h	Nominal torque	Nm	19.2	19.2	24	24	38	38	48	48
50 % ED	60 % ED	Nominal speed	RPM	3315	490	3320	470	3390	540	3410	540
30/4 min		Short time duty	min								
		Power factor		0.88	0.49	0.90	0.53	0.85	0.52	0.90	0.47
		Efficiency		0.76	0.33	0.77	0.35	0.82	0.48	0.83	0.49
		Load	tm/min	30		38		60		76	
	300	Nominal power	kW	5.4	0.9	7.2	1.2	11	1.6	14	2.3
	starts/h	Nominal torque	Nm	15.3	15.3	19.2	19.2	30	30	38	38
	60 % ED	Nominal speed	RPM	3390	520	3395	500	3445	555	3460	555
		Short time duty	min								
		Power factor		0.85	0.43	0.87	0.47	0.82	0.48	0.88	0.41
		Efficiency		0.75	0.31	0.77	0.34	0.82	0.46	0.83	0.46
		Load	tm/min	24		30		48		60	
	300	Nominal power	kW	4.3	0.7	5.4	0.9	9	1.4	11	1.6
	starts/h	Nominal torque	Nm	12.3	12.3	15.3	15.3	24	24	30	30
	60 % ED	Nominal speed	RPM	3440	540	3450	525	3495	565	3495	565
		Short time duty	min								
		Power factor		0.78	0.39	0.83	0.42	0.74	0.42	0.85	0.37
		Efficiency		0.74	0.28	0.77	0.31	0.82	0.39	0.83	0.41

☞ For Duty Group 1Am/M4 use the motor values of Duty Group 2m/M5.

Duty Group Fem/ISO	Q motor data			P8*	
				MF13XA106	
		Rated power	kW	25	3.8
		Synchronous speed	RPM	3600	600
		Brake torque	Nm	200	
		Max el. br. torque	Nm		290
		El. br. torque	Nm		150
		Power fact. start		0.68	0.69
		Starting torque	Nm	160	140
		Weight	kg	99	
		Brake inertia	kgm^2	0.0017	
		Inertia w/o brake	kgm^2	0.043	
1Am/M4		Load	tm/min	135	
180	300	Nominal power	kW	25	3.8
starts/h	starts/h	Nominal torque	Nm	69	69
30 % ED	50 % ED	Nominal speed	RPM	3430	530
15/3 min		Short time duty	min	15	10
		Power factor		0.87	0.54
		Efficiency		0.86	0.49

*) Note! P8 hoisting motor for 1Am use only. External fan as standard.

3.4 Motor currents, 2 - speed pole change motors, 60 Hz

				Currents							
			Nominal voltage	220 V		380 V		460 V		575 V	
			Used in voltage range	208…230 V		360…400 V		440…480 V		575…600 V	
			tm/min	fast	slow	fast	slow	fast	slow	fast	slow
PX	Starting current	(A)						15	3.0		
MF09ZA106	Nominal current	(A)									
			9.6					3.7	2.2		
	No-load current	(A)						2.1	2.1		
P1	Starting current	(A)		42	9	23	4.7				
MF10M-106	Nominal current	(A)									
			12	9.8	5.9	5.0	3.4	4.7	2.8	3.6	2.2
			9.6	8.8	5.2	5.1	3.0	4.2	2.5	3.4	2.0
			7.6	7.9	5.2	4.6	3.0	3.8	2.5	3.0	2.0
			6	7.1	5.2	4.1	3.0	3.4	2.5	2.7	2.0
	No-load current	(A)		5.2	5.9	3	3.1	2.5	2.8	2	2.1
P2	Starting current	(A)		90	15	52	8.8	43	7.3	34	5.8
MF10Z-106	Nominal current	(A)									
			24	17	8.4	10	4.8	8.3	4.0	6.6	3.2
			19.2	15.3	8.2	8.8	4.7	7.3	3.9	5.8	3.1
			15	12.5	8.2	7.3	4.7	6	3.9	4.8	3.1
			12	11.5	8.2	6.7	4.7	5.5	3.9	4.4	3.1
	No-load current	(A)		7.9	8.6	4.6	5.0	3.8	4.1	3.0	3.3
P3	Starting current	(A)		102	18	59	10.2	49	8.4	39	6.7
MF10X-106	Nominal current	(A)									
			30	22	11	13	6.5	10	5.4	8.2	4.3
			24	18	10.2	10.3	5.9	8.5	4.9	6.8	3.9
			19.2	15	10.2	8.7	5.9	7.2	4.9	5.8	3.9
			15	13	10.2	7.3	5.9	6	4.9	4.8	3.9
	No-load current	(A)		8.4	11.3	4.8	6.5	4	5.4	3.2	4.3
P4	Starting current	(A)		146	29	85	17	70.0	14.0	56	11.2
MF11XA106	Nominal current	(A)									
			48	36	19	21	11	17	9.1	14	7.3
			38	27	17	16	10.0	13	8.3	10.4	6.6
			30	23	17	13	10.0	11	8.3	8.8	6.6
			24	21	17	12	10.0	10	8.3	8.0	6.6
	No-load current	(A)		12.5	18	7.3	10.7	6.0	8.8	4.8	7.0
P5	Starting current	(A)		167	31	97	18.2	80	15	64	12.0
MF11X-106	Nominal current	(A)									
			60	42	21	24	12	20	10	16	8.0
			48	33	18	19	10.5	16	8.7	12.8	7.0
			38	28	18	16	10.3	13.5	8.5	10.8	6.8
			30	23	18	13	10.3	11	8.5	8.8	6.8
	No-load current	(A)		14	20	8.1	11.5	6.7	9.5	5.4	7.6
P6	Starting current	(A)		312	52	180	30	149	25	119	20
MF13Z-106	Nominal current	(A)									
			96	67	27	39	16	32	13	26	10
			76	54	27	31	15.7	26	13	21	10.4
			60	46	25	27	14.5	22	12	18	9.6
			48	36	25	21	14.5	17	12	13.6	9.6
	No-load current	(A)		27	25	16	14.5	13	12	10.4	9.6
P7	Starting current	(A)		433	73	251	42	207	35	166	28
MF13X-106	Nominal current	(A)									
			120	79	33	46	19	38	16	30	13
			96	59	29	34	17	28	14	22	11.2
			76	46	29	27	17	22	14	18	11.2

				Currents							
			Nominal voltage	220 V		380 V		460 V		575 V	
			Used in voltage range	208…230 V		360…400 V		440…480 V		575…600 V	
			tm/min	fast	slow	fast	slow	fast	slow	fast	slow
			60	40	29	23	17	19	14	15	11.2
	No-load current	(A)		21	33	12	19	10	16	8.0	12.8
P8	Starting current	(A)		460	121	266	70	220	35	176	28
MF13XA106	Nominal current	(A)									
			135	98	47	57	27	47	22	38	18
	No-load current	(A)		40	41	23	24	19	20	15.2	16

3.5 Motor data, inverter motors, 100 Hz

Duty Group Fem/ISO	Q motor data			T1	T2	T3	T4	T5	T6
				MF10MA200	MF10MB200	MF10MC200	MF11MA200	MF11MB200	MF13Z-200
		Rated power	kW	1.8	3.6	4.5	7.5	9	15
		Synchronous speed	RPM	3000	3000	3000	3000	3000	3000
		Brake torque	Nm	21	42	42	54	54	100
		Max el. br. torque	Nm						
		El. br. torque	Nm						
		Power fact. start							
		Pull-out torque	Nm	16.6	32	40	80	80	165
		Speed at 80% of pull-out torque	rpm	2500	2500	2410	2500	2500	2700
		Starting torque	Nm						
		Weight	kg	23	23	23	37	37	59
		Brake inertia	kgm^2	0.00017	0.00017	0.00045	0.0007	0.0007	0.0007
		Inertia w/o brake	kgm^2	0.0027	0.0027	0.0027	0.0075	0.0075	0.024
2m/M5		Load	tm/min	10	20	25	40	50	80
240	300	Nominal power	kW	1.8	3.6	4.5	7.5	9	15
starts/h	starts/h	Nominal torque	Nm	6.1	12.3	15.3	24	30	48
40 % ED	60 % ED	Nominal speed	RPM	2830	2790	2780	2860	2830	2910
30/3.5 min		Short time duty	min	60	60	60	30	30	30
		Power factor		0.74	0.75	0.78	0.74	0.78	0.85
		Efficiency		0.73	0.75	0.77	0.81	0.81	0.86
3m/M6		Load	tm/min	8	16	20	32	40	63
300	300	Nominal power	kW	1.5	2.9	3.6	6	7.5	12
starts/h	starts/h	Nominal torque	Nm	4.9	9.8	12.3	19.2	24	38
50 % ED	60 % ED	Nominal speed	RPM	2860	2830	2830	2900	2860	2925
30/4 min		Short time duty	min						
		Power factor		0.69	0.69	0.72	0.67	0.74	0.79
		Efficiency		0.71	0.74	0.77	0.80	0.81	0.86
		Load	tm/min	6.3	12.5	16	25	32	50
	300	Nominal power	kW	1.2	2.4	2.9	4.5	6	9
	starts/h	Nominal torque	Nm	3.9	7.7	9.8	15.3	19.2	30
	60 % ED	Nominal speed	RPM	2880	2870	2880	2925	2900	2940
		Short time duty	min						
		Power factor		0.64	0.63	0.65	0.61	0.67	0.72
		Efficiency		0.67	0.73	0.76	0.78	0.80	0.84
		Load	tm/min	5	10	12.5	20	25	40
	300	Nominal power	kW	0.9	1.8	2.4	3.6	4.5	7.5
	starts/h	Nominal torque	Nm	3	6.1	7.7	12.3	15.3	24
	60 % ED	Nominal speed	RPM	2905	2900	2905	2940	2925	2960
		Short time duty	min						
		Power factor		0.57	0.55	0.58	0.55	0.61	0.68
		Efficiency		0.63	0.69	0.74	0.76	0.78	0.81

☞ For Duty Group 1Am/M4 use the values of Duty Group 2m/M5.

Duty Group Fem/ISO	Q motor data			T7	T8	T9	TA
				MF13ZA200	MF13ZB200	MF13ZC200	MF13X-200
		Rated power	kW	18	23	28	35
		Synchronous speed	RPM	3000	3000	3000	3000
		Brake torque	Nm	130	200	200	200
		Max el. br. torque	Nm				
		El. br. torque	Nm				
		Power fact. start					
		Pull-out torque	Nm	165	200	275	350
		Speed at 80% of pull-out torque	rpm	2700	2720	2710	2750
		Starting torque	Nm				
		Weight	kg	59	72	85	99
		Brake inertia	kgm^2	0.0017	0.0017	0.0017	0.0017
		Inertia w/o brake	kgm^2	0.024	0.030	0.036	0.043
2m/M5		Load	tm/min	100	125	160	200
240	300	Nominal power	kW	18	23	28	35
starts/h	starts/h	Nominal torque	Nm	62	76	96	116
40 % ED	60 % ED	Nominal speed	RPM	2890	2890	2880	2880
30/3.5 min		Short time duty	min	30	30	30	30
		Power factor		0.87	0.88	0.87	0.85
		Efficiency		0.87	0.89	0.89	0.90
3m/M6		Load	tm/min	80	100	125	160
300	300	Nominal power	kW	15	18	23	28
starts/h	starts/h	Nominal torque	Nm	48	62	76	96
50 % ED	60 % ED	Nominal speed	RPM	2910	2910	2920	2930
30/4 min		Short time duty	min				
		Power factor		0.85	0.86	0.84	0.83
		Efficiency		0.86	0.89	0.89	0.89
		Load	tm/min	63	80	100	125
	300	Nominal power	kW	12	15	18	23
	starts/h	Nominal torque	Nm	38	48	62	76
	60 % ED	Nominal speed	RPM	2925	2930	2935	2940
		Short time duty	min				
		Power factor		0.79	0.82	0.80	0.78
		Efficiency		0.86	0.89	0.88	0.89
		Load	tm/min	50	63	80	100
	300	Nominal power	kW	9	12	15	18
	starts/h	Nominal torque	Nm	30	38	48	62
	60 % ED	Nominal speed	RPM	2940	2940	2950	2950
		Short time duty	min				
		Power factor		0.72	0.77	0.74	0.73
		Efficiency		0.84	0.88	0.87	0.88

For Duty Group 1Am/M4 use the values of Duty Group 2m/M5.

3.6 Motor data, inverter motors, 120 Hz

Duty Group Fem/ISO	Q motor data			T1	T2	T3	T4	T5	T6
				MF10MA200	MF10MB200	MF10MC200	MF11MA200	MF11MB200	MF13Z-200
		Rated power	kW	2.2	4.3	5.4	9	11	18
		Synchronous speed	RPM	3600	3600	3600	3600	3600	3600
		Brake torque	Nm	21	21	42	54	54	100
		Max el. br. torque	Nm						
		El. br. torque	Nm						
		Power fact. start							
		Pull-out torque	Nm	16	31	39	76	76	152
		Speed at 80% of pull-out torque	rpm	3100	3100	3040	3100	3100	3300
		Starting torque	Nm						
		Weight	kg	23	23	23	37	37	59
		Brake inertia	kgm^2	0.00017	0.00017	0.00045	0.0007	0.0007	0.0007
		Inertia w/o brake	kgm^2	0.0027	0.0027	0.0027	0.0075	0.0075	0.024
2m/M5		Load	tm/min	12	24	30	48	60	96
240	300	Nominal power	kW	2.2	4.3	5.4	9	11	18
starts/h	starts/h	Nominal torque	Nm	6.1	12.3	15.3	24	30	48
40 % ED	60 % ED	Nominal speed	RPM	3420	3370	3340	3440	3410	3500
30/3.5 min		Short time duty	min	60	60	60	30	30	30
		Power factor		0.75	0.77	0.80	0.75	0.78	0.85
		Efficiency		0.71	0.76	0.77	0.78	0.81	0.86
3m/M6		Load	tm/min	9.6	19.2	24	38	48	76
300	300	Nominal power	kW	1.8	3.5	4.3	7.2	9	14
starts/h	starts/h	Nominal torque	Nm	4.9	9.8	12.3	19.2	24	38
50 % ED	60 % ED	Nominal speed	RPM	3450	3415	3390	3485	3440	3520
30/4 min		Short time duty	min						
		Power factor		0.72	0.70	0.76	0.69	0.75	0.81
		Efficiency		0.69	0.75	0.77	0.78	0.78	0.85
		Load	tm/min	7.6	15.4	19.2	30	38	60
	300	Nominal power	kW	1.4	2.9	3.5	5.4	7.2	11
	starts/h	Nominal torque	Nm	3.9	7.7	9.8	15.3	19.2	30
	60 % ED	Nominal speed	RPM	3475	3455	3430	3515	3485	3540
		Short time duty	min						
		Power factor		0.68	0.66	0.70	0.62	0.69	0.75
		Efficiency		0.65	0.74	0.76	0.75	0.78	0.82
		Load	tm/min	6	12	15.4	24	30	48
	300	Nominal power	kW	1.1	2.2	2.9	4.3	5.4	9
	starts/h	Nominal torque	Nm	3	6.1	7.7	12.3	15.3	24
	60 % ED	Nominal speed	RPM	3500	3490	3470	3530	3515	3560
		Short time duty	min						
		Power factor		0.62	0.58	0.63	0.56	0.62	0.70
		Efficiency		0.61	0.70	0.73	0.73	0.75	0.80

☞ For Duty Group 1Am/M4 use the values of Duty Group 2m/M5.

Duty Group Fem/ISO	Q motor data			T7	T8	T9	TA
				MF13ZA200	MF13ZB200	MF13ZC200	MF13X-200
		Rated power	kW	21	27	34	42
		Synchronous speed	RPM	3600	3600	3600	3600
		Brake torque	Nm	130	200	200	200
		Max el. br. torque	Nm				
		El. br. torque	Nm				
		Power fact. start					
		Pull-out torque	Nm	152	190	265	335
		Speed at 80% of pull-out torque	rpm	3300	3260	3210	3250
		Starting torque	Nm				
		Weight	kg	59	72	85	99
		Brake inertia	kgm^2	0.0017	0.0017	0.0017	0.0017
		Inertia w/o brake	kgm^2	0.024	0.030	0.036	0.043
2m/M5		Load	tm/min	120	150	192	240
240	300	Nominal power	kW	21	27	34	41
starts/h	starts/h	Nominal torque	Nm	62	76	96	116
40 % ED	60 % ED	Nominal speed	RPM	3480	3470	3470	3470
30/3.5 min		Short time duty	min	30	30	30	30
		Power factor		0.87	0.88	0.88	0.87
		Efficiency		0.87	0.89	0.89	0.89
3m/M6		Load	tm/min	96	120	150	192
300	300	Nominal power	kW	18	21	27	34
starts/h	starts/h	Nominal torque	Nm	48	62	76	96
50 % ED	60 % ED	Nominal speed	RPM	3500	3500	3500	3500
30/4 min		Short time duty	min				
		Power factor		0.85	0.86	0.86	0.86
		Efficiency		0.86	0.89	0.89	0.89
		Load	tm/min	76	96	120	150
	300	Nominal power	kW	14	18	21	27
	starts/h	Nominal torque	Nm	38	48	62	76
	60 % ED	Nominal speed	RPM	3520	3520	3520	3520
		Short time duty	min				
		Power factor		0.81	0.84	0.83	0.84
		Efficiency		0.85	0.89	0.89	0.90
		Load	tm/min	60	76	96	120
	300	Nominal power	kW	11	14	18	21
	starts/h	Nominal torque	Nm	30	38	48	62
	60 % ED	Nominal speed	RPM	3540	3540	3540	3540
		Short time duty	min				
		Power factor		0.75	0.80	0.78	0.80
		Efficiency		0.82	0.89	0.88	0.91

For Duty Group 1Am/M4 use the values of Duty Group 2m/M5.

3.7 Motor currents, inverter motors, 100 Hz and 120 Hz

			100 Hz		120 Hz	
				Current		Current
	Nominal voltage			400 V		460
	Used in voltage range			380…415 V		440…480 V
			tm/min		tm/min	
T1	Current at 80% of pull-out torque	(A)		11.0		11.0
MF10MA200	Nominal current	(A)	10	4.8	12	4.9
			8	4.4	9.6	4.6
			6.3	4.1	7.6	4.1
			5	3.7	6	3.7
	No-load current	(A)		3.2		3.0
T2	Current at 80% of pull-out torque	(A)		17.2		17.2
MF10MB200	Nominal current	(A)	20	9.4	24	9.3
			16	8.3	19.2	8.2
			12.5	7.5	15	7.3
			10	6.9	12	6.6
	No-load current	(A)		6.2		5.7
T3	Current at 80% of pull-out torque	(A)		21.2		21.5
MF10MC200	Nominal current	(A)	25	10.7	30	10.8
			20	9.3	24	9.3
			16	8.3	19.2	8.1
			12.5	7.6	15	7.5
	No-load current	(A)		6.3		5.9
T4	Current at 80% of pull-out torque	(A)		42		42
MF11MA200	Nominal current	(A)	40	18	48	19
			32	15.5	38	17
			25	14.3	30	15.0
			20	13.8	24	14.0
	No-load current	(A)		11.8		11.0
T5	Current at 80% of pull-out torque	(A)		42		42
MF11MB200	Nominal current	(A)	50	21	60	22
			40	18	48	19
			32	15.5	38	17
			25	14.3	30	15.0
	No-load current	(A)		11.8		11.0
T6	Current at 80% of pull-out torque	(A)		78		78
MF13Z-200	Nominal current	(A)	80	31	96	31
			63	25	76	26
			50	23	60	23
			40	20	48	20
	No-load current	(A)		15		14
T7	Current at 80% of pull-out torque	(A)		78		78
MF13ZA200	Nominal current	(A)	100	36	120	37
			80	31	96	31
			63	25	76	26
			50	23	60	23
	No-load current	(A)		15		14
T8	Current at 80% of pull-out torque	(A)		90		93
MF13ZB200	Nominal current	(A)	125	42	150	44
			100	34	120	36
			80	28	96	29
			63	24	76	25
	No-load current	(A)		17		16
T9	Current at 80% of pull-out torque	(A)		125		130
MF13ZC200	Nominal current	(A)	160	55	192	56
			125	45	150	46
			100	39	120	39
			80	34	96	33

			100 Hz		120 Hz	
				Current		Current
		Nominal voltage		400 V		460
		Used in voltage range		380…415 V		440…480 V
			tm/min		tm/min	
	No-load current	(A)		22		20
TA	Current at 80% of pull-out torque	(A)		157		160
MF13X-200	Nominal current	(A)	200	64	240	65
			160	57	192	56
			125	48	150	48
			100	42	120	41
	No-load current	(A)		26		23

3.8 Motor data, one speed motors, 50 Hz

Duty Group Fem/ISO	Q motor data			MF07X-100	MF09ZB100
				OX	OZ
		Rated power	kW	1.5	2.5
		Synchronous speed	RPM	3000	3000
		Brake torque	Nm	12	21
		Max el. br. torque	Nm	-	-
		El. br. torque	Nm	-	-
		Power fact. start		0.83	0.75
		Starting torque	Nm	12	22
		Weight	kg	10	21
		Brake inertia	kgm^2	0.00006	0.00017
		Inertia w/o brake	kgm^2	0.0012	0.0039
2m/M5		Load	tm/min	8	13.4
240	240	Nominal power	kW	1.5	2.5
starts/h	starts/h	Nominal torque	Nm	5.4	8.5
40 % ED	40 % ED	Nominal speed	RPM	2700	2850
30/3.5 min		Short time duty	min	30	30
		Power factor		0.79	0.88
		Efficiency		0.63	0.68

☞ For Duty Group 1Am/M4 use the values of Duty Group 2m/M5.

3.9 Motor currents, one speed motors, 50 Hz

				Currents			
		Nominal voltage		200 V	400 V	500 V	660 V
		Used in voltage range		180…220 V	380…415 V	500…525 V	660…690 V
			tm/min				
OX	Starting current	(A)		27	14		
MF07X-100	Nominal current	(A)					
			8	8.7	4.3		
	No-load current	(A)		6.6	4.4		
OZ	Starting current	(A)		64	32		
MF09ZB100	Nominal current	(A)					
			13.4	12.3	6.0		
	No-load current	(A)		6.0	3.0		

3.10 Motor data, one speed motors, 60 Hz

Duty Group Fem/ISO	Q motor data			MF07X-100	MF09ZB100
				OX	OZ
		Rated power	kW	1.8	3
		Synchronous speed	RPM	3600	3600
		Brake torque	Nm	12	21
		Max el. br. torque	Nm	-	-
		El. br. torque	Nm	-	-
		Power fact. start		0.83	0.75
		Starting torque	Nm	9	14
		Weight	kg	10	21
		Brake inertia	kgm^2	0.00006	0.00017
		Inertia w/o brake	kgm^2	0.0012	0.0039
2m/M5		Load	tm/min	9.6	16
240	240	Nominal power	kW	1.8	3
starts/h	starts/h	Nominal torque	Nm	5.4	8.6
40 % ED	40 % ED	Nominal speed	RPM	2950	3380
30/3.5 min		Short time duty	min	30	30
		Power factor		0.90	0.92
		Efficiency		0.57	0.70

☞ For Duty Group 1Am/M4 use the values of Duty Group 2m/M5.

3.11 Motor currents, one speed motors, 60 Hz

				Currents			
			Nominal voltage	220 V	380 V	460 V	575 V
			Used in voltage range	208…230 V	360…400 V	440…480 V	575…600 V
			tm/min				
OX	Starting current	(A)		25		14	
MF07X-100	Nominal current	(A)					
			9.6	8.7		4.3	
	No-load current	(A)		4.2		4.4	
OZ	Starting current	(A)		60		32	
MF09ZB100	Nominal current	(A)					
			16	12.4		7.0	
	No-load current	(A)		4.3		3.0	

4 TRAVELLING MOTORS

4.1 One speed, 3000 RPM (100 Hz), 3600 RPM (120 Hz) and 4800 RPM (80Hz)

These motors are driven with fixed voltages and frequencies with the below specified line voltages (=inverter supply voltage). Motor nameplate data is the same for all line voltages. Other voltage/frequency versions are not available for these motors.

Duty type	Motor code		MF06MA100		MF06MA200		MF06LA100		MF06LA200	
	Speed control		**inverter**		**inverter**		**inverter**		**inverter**	
	Inverter supply voltage		**380-480V**		**380-480V**	**440-480V**	**380-480V**		**380-480V**	**440-480V**
	Motor voltage		**400 V**		**400 V**	**460 V**	**400 V**		**400 V**	**460 V**
	Frequency		**80 Hz**		**100 Hz**	**120 Hz**	**80 Hz**		**100 Hz**	**120 Hz**
	Brake type		**compact**		**compact**	**compact**	**compact**		**compact**	**compact**
	Synchronous speed	RPM	4800		3000	3600	4800		3000	3600
	Brake torque	Nm	2		2	2	2		2	2
	Starting torque	Nm	3.2		3.0	2.9	5.6		7.2	7.1
	Electric braking torque	Nm								
	Starting current	A	6.5		4.2	4.3	10.3		8.2	8.5
	Maximum torque	Nm	3.2		3.0	2.9	5.6		7.2	7.1
	Speed at max. torque	RPM	0		0	0	0		0	0
	80% of max. torque	Nm	2.6		2.4	2.4	4.5		5.7	5.7
	Speed at 80% torque	RPM	3700		2200	2600	3600		2200	2650
	Current at 80% torque	A	3.8		2.1	2.1	6.0		4.8	4.8
	Inertia	kgm^2	0.0004		0.0004	0.0004	0.0007		0.0007	0.0007
	Inertia with flywheel	kgm^2								
	Power factor, starting		0.74		0.72	0.70	0.75		0.71	0.69
	Weight with fan	kg								
	Weight	kg	4.9		4.9	4.9	6.8		6.8	6.8
	No-load current	A	1.2		1.0	1.0	1.1		1.6	1.6
	Iron losses	W								
	Stator resistance at 20 °C	Ω	19.5		34	34	12.2		14.7	14.7
	Speed	RPM	4550		2760	3380	4500		2780	3330
	Power	kW	0.45		0.45	0.45	0.9		0.75	0.75
S3-20%	Current	A	2.1		1.4	1.4	2.3		2.3	2.3
	Starting burden	kgm^2/h								
	Power factor		0.63		0.68	0.63	0.77		0.67	0.67
	Efficiency		0.66		0.66	0.66	0.72		0.74	0.74
	Speed	RPM	4550		2855	3430	4560		2850	3440
	Power	kW	0.45		0.3	0.37	0.65		0.45	0.55
S3-40%	Current	A	2.1		1.2	1.2	2.1		1.8	1.8
	Starting burden	kgm^2/h								
	Power factor		0.63		0.57	0.59	0.71		0.52	0.53
	Efficiency		0.66		0.65	0.65	0.68		0.73	0.74
	Speed	RPM			2855	3450	4640		2850	3470
	Power	kW			0.3	0.3	0.45		0.45	0.45
S3-60%	Current	A			1.2	1.2	1.8		1.8	1.8
	Starting burden	kgm^2/h								
	Power factor				0.57	0.59	0.60		0.52	0.52
	Efficiency				0.65	0.65	0.64		0.73	0.73
	Speed	RPM								
	Power	kW								
S3-100%	Current	A								
	Starting burden	kgm^2/h								
	Power factor									
	Efficiency									

Duty type	Motor code		MF06LA20P		MF06LB100		MF06LB200	
	Speed control		inverter		inverter		inverter	
	Inverter supply voltage		380-480V	440-480V	380-480V		380-480V	440-480V
	Motor voltage		400 V	460 V	400 V		400 V	460 V
	Frequency		100 Hz	120 Hz	80 Hz		100 Hz	120 Hz
	Brake type		compact	compact	DC		DC	DC
	Synchronous speed	RPM	3000	3600	4800		3000	3600
	Brake torque	Nm	2	2	4		4	4
	Starting torque	Nm	7.2	7.1	10.4		10.5	10.4
	Electric braking torque	Nm						
	Starting current	A	8.2	8.5	16.4		12.9	12.6
	Maximum torque	Nm	7.2	7.1	10.4		11	10.8
	Speed at max. torque	RPM	0	0	0		1480	1770
	80% of max. torque	Nm	5.7	5.7	8.3		8.9	8.9
	Speed at 80% torque	RPM	2200	2650	3350		2350	2820
	Current at 80% torque	A	4.8	4.8	9.0		6.6	6.6
	Inertia	kgm^2	0.0007	0.0007	0.0006		0.0006	0.0006
	Inertia with flywheel	kgm^2						
	Power factor, starting		0.71	0.69	0.84		0.77	0.74
	Weight with fan	kg						
	Weight	kg	6.8	6.8	7.8		7.8	7.8
	No-load current	A	1.6	1.6	2.0		2.2	2.0
	Iron losses	W						
	Stator resistance at 20 °C	Ω	14.7	14.7	8.8		10.4	10.4
	Speed	RPM			4450		2720	3320
	Power	kW			1.3		1.3	1.3
S3-20%	Current	A			3.1		3.3	3.2
	Starting burden	kgm^2/h						
	Power factor				0.82		0.77	0.74
	Efficiency				0.78		0.73	0.76
	Speed	RPM	2800	3360	4500		2770	3370
	Power	kW	0.65	0.75	1.1		1.1	1.1
S3-40%	Current	A	2.1	2.1	2.9		3.0	2.9
	Starting burden	kgm^2/h						
	Power factor		0.61	0.61	0.78		0.73	0.74
	Efficiency		0.73	0.74	0.78		0.74	0.76
	Speed	RPM			4600		2840	3450
	Power	kW			0.75		0.65	0.65
S3-60%	Current	A			2.3		2.5	2.4
	Starting burden	kgm^2/h						
	Power factor				0.65		0.60	0.62
	Efficiency				0.75		0.70	0.71
	Speed	RPM						
	Power	kW						
S3-100%	Current	A						
	Starting burden	kgm^2/h						
	Power factor							
	Efficiency							

Duty type	Motor code		MF07XA100		MF07XB100		MF07XA200		MF07XB200	
	Speed control		**inverter**		**inverter**		**inverter**		**inverter**	
	Inverter supply voltage		**380-480V**		**380-480V**		**380-480V**	**440-480V**	**380-480V**	**440-480V**
	Motor voltage		**400 V**		**400 V**		**400 V**	**460 V**	**400 V**	**460 V**
	Frequency		**80 Hz**		**80 Hz**		**100 Hz**	**120 Hz**	**100 Hz**	**120 Hz**
	Brake type		**DC**		**DC**		**DC**	**DC**	**DC**	**DC**
	Synchronous speed	RPM	4800		4800		3000	3600	3000	3600
	Brake torque	Nm	16		16		16	16	16	16
	Starting torque	Nm	11.7		16.5		13.5	12.7	23.5	21.6
	Electric braking torque	Nm								
	Starting current	A	23.5		32		19.3	19.4	35	34
	Maximum torque	Nm	12		17		17.5	16.5	25	23
	Speed at max. torque	RPM	2250		2200		2010	2410	1590	1910
	80% of max. torque	Nm	9.6		13		14	13.1	20	18
	Speed at 80% torque	RPM	3770		4050		2620	3140	2470	2970
	Current at 80% torque	A	10.4		14		10	10.6	15	13.5
	Inertia	kgm^2	0.0012		0.0012		0.0012	0.0012	0.0012	0.0012
	Inertia with flywheel	kgm^2								
	Power factor, starting		0.77		0.79		0.67	0.63	0.67	0.64
	Weight with fan	kg	13		13		13	13	13	13
	Weight	kg								
	No-load current	A	2.6		6.0		2.5	2.3	5.4	4.9
	Iron losses	W								
	Stator resistance at 20 °C	Ω	5.6		3.75		6.3	6.3	3.8	3.8
	Speed	RPM	4440		4420		2820	3370	2840	3440
	Power	kW	2.2		3.6		1.8	2.2	2.5	3
S3-20%	Current	A	5.0		8.8		4.3	4.6	7.2	6.9
	Starting burden	kgm^2/h								
	Power factor		0.88		0.79		0.79	0.81	0.68	0.71
	Efficiency		0.74		0.74		0.74	0.75	0.74	0.76
	Speed	RPM	4520		4460		2850	3430	2860	3460
	Power	kW	1.8		3		1.5	1.8	2.2	2.5
S3-40%	Current	A	4.3		7.9		3.9	3.9	6.9	6.5
	Starting burden	kgm^2/h								
	Power factor		0.84		0.78		0.75	0.76	0.66	0.68
	Efficiency		0.75		0.74		0.75	0.76	0.73	0.75
	Speed	RPM	4520		4460		2850	3430	2860	3460
	Power	kW	1.8		3		1.5	1.8	2.2	2.5
S3-60%	Current	A	4.3		7.9		3.9	3.9	6.9	6.5
	Starting burden	kgm^2/h								
	Power factor		0.84		0.78		0.75	0.76	0.66	0.68
	Efficiency		0.75		0.74		0.75	0.76	0.73	0.75
	Speed	RPM	4520				2850	3430	2890	3480
	Power	kW	1.8				1.5	1.8	1.8	2.2
S3-100%	Current	A	4.3				3.9	3.9	6.4	6.1
	Starting burden	kgm^2/h								
	Power factor		0.84				0.75	0.76	0.59	0.63
	Efficiency		0.75				0.75	0.76	0.70	0.74

4.2 Two speed, 3000/750 RPM (50Hz) and 3600/900 RPM (60Hz)

Duty type	Motor code		MF06MA104		MF06MA104		MF06LA104		MF06LA104	
	Speed control		2-speed		2-speed		2-speed		2-speed	
	Voltage		380V - 415V		440V - 480V		380V - 415V		440V - 480V	
	Frequency		50 Hz		60 Hz		50 Hz		60 Hz	
	Brake type		DC		DC		DC		DC	
			fast	slow	fast	slow	fast	slow	fast	slow
	Synchronous speed	RPM	3000	750	3600	900	3000	750	3600	900
	Brake torque	Nm	2	2	2	2	2	2	2	2
	Starting torque	Nm	2.2	1.7	2.2	1.8	3.3	2.5	3.3	2.4
	Electric braking torque	Nm		5.6/2.0		5.6/2.0		8/3.5		8/3.5
	Starting current	A	3.5	1.0	3.9	1.1	5.0	1.4	5.3	1.5
	Maximum torque	Nm	2.2	1.8	2.2	1.8	3.6	2.7	3.5	2.6
	Speed at max. torque	RPM	2150	400	2750	550	1620	380	2220	530
	80% of max. torque	Nm	1.7	1.4	1.7	1.4	2.8	2.1	2.7	2.0
	Speed at 80% torque	RPM	2500	570	3080	740	2100	530	2800	680
	Current at 80% torque	A	1.5	0.8	1.5	0.8	2.3	1.3	2.2	1.3
	Inertia	kgm^2	0.0004	0.0004	0.0004	0.0004	0.0006	0.0006	0.0006	0.0006
	Inertia with flywheel	kgm^2								
	Power factor, starting		0.94	0.93	0.91	0.92	0.92	0.93	0.91	0.92
	Weight with fan	kg								
	Weight	kg	5.7	5.7	5.7	5.7	7.8	7.8	7.8	7.8
	No-load current	A	0.9	0.8	0.9	0.8	1.1	1.2	1.1	1.2
	Iron losses	W								
	Stator resistance at 20 °C	Ω	69	280	69	280	50	175	50	175
	Speed	RPM	2800	690	3400	810	2760	660	3340	810
	Power	kW	0.3	0.05	0.37	0.07	0.45	0.1	0.55	0.12
S3-20%	Current	A	1.0	0.8	0.9	0.9	1.3	1.2	1.3	1.2
	Starting burden	kgm^2/h	2		1.4		3		2.1	
	Power factor		0.7	0.77	0.74	0.78	0.83	0.67	0.82	0.80
	Efficiency		0.67	0.12	0.67	0.12	0.67	0.20	0.67	0.20
	Speed	RPM	2800	690	3400	810	2760	660	3340	810
	Power	kW	0.3	0.05	0.37	0.07	0.45	0.1	0.55	0.12
S3-40%	Current	A	1.0	0.8	0.9	0.9	1.3	1.2	1.3	1.2
	Starting burden	kgm^2/h	1.5		1.0		2.5		1.9	
	Power factor		0.7	0.77	0.74	0.78	0.83	0.67	0.82	0.80
	Efficiency		0.67	0.12	0.67	0.12	0.67	0.20	0.67	0.20
	Speed	RPM								
	Power	kW								
S3-60%	Current	A								
	Starting burden	kgm^2/h								
	Power factor									
	Efficiency									
	Speed	RPM								
	Power	kW								
S3-100%	Current	A								
	Starting burden	kgm^2/h								
	Power factor									
	Efficiency									

Duty type	Motor code		MF07X-104		MF07X-104		MF07XA104		MF07XA104	
	Speed control		2-speed		2-speed		2-speed		2-speed	
	Voltage		380V - 415V		440V - 480V		380V - 415V		440V - 480V	
	Frequency		50 Hz		60 Hz		50 Hz		60 Hz	
	Brake type		DC		DC		DC		DC	
			fast	slow	fast	slow	fast	slow	fast	Slow
	Synchronous speed	RPM	3000	750	3600	900	3000	750	3600	900
	Brake torque	Nm	8	8	8	8	8	8	8	8
	Starting torque	Nm	5.8	5.2	5.6	4.8	7.5	5.4	6.9	5.0
	Electric braking torque	Nm		10/9		10/9		11/9		11/9
	Starting current	A	8.0	2.4	8.0	2.3	9.9	3.1	10	3.1
	Maximum torque	Nm	5.9	5.2	5.7	4.8	7.5	5.4	6.9	5.0
	Speed at max. torque	RPM	1700	0	2040	0	0	0	0	0
	80% of max. torque	Nm	4.6	4.1	4.5	3.8	6	4.3	5.5	4
	Speed at 80% torque	RPM	2400	590	2880	710	2360	505	2830	605
	Current at 80% torque	A	3.9	2.3	3.6	2.3	4.9	2.4	4.7	2.4
	Inertia	kgm^2	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
	Inertia with flywheel	kgm^2	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036
	Power factor, starting		0.90	0.80	0.89	0.78	0.89	0.79	0.88	0.76
	Weight with fan	kg								
	Weight with flywheel	kg	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
	No-load current	A	2.2	1.7	1.9	1.7	3.2	2.2	3.0	2.2
	Iron losses	W								
	Stator resistance at 20 °C	Ω	23	75	23	75	19	72	19	72
	Speed	RPM	2720	590	3370	750	2730	590	3310	740
	Power	kW	0.75	0.18	0.9	0.2	0.9	0.2	1.1	0.25
S3-20%	Current	A	2.7	1.9	2.7	1.9	3.5	2.3	3.4	2.3
	Starting burden	kgm^2/h	7		4.9		7.1		5	
	Power factor		0.80	0.67	0.79	0.64	0.74	0.70	0.77	0.63
	Efficiency		0.57	0.24	0.62	0.26	0.59	0.21	0.62	0.25
	Speed	RPM	2720	590	3370	750	2730	590	3310	740
	Power	kW	0.75	0.18	0.9	0.2	0.9	0.2	1.1	0.25
S3-40%	Current	A	2.7	1.9	2.7	1.9	3.5	2.3	3.4	2.3
	Starting burden	kgm^2/h	6.5		4.5		6.6		4.6	
	Power factor		0.80	0.67	0.79	0.64	0.74	0.70	0.77	0.63
	Efficiency		0.57	0.24	0.62	0.26	0.59	0.21	0.62	0.25
	Speed	RPM	2720	590	3370	750				
	Power	kW	0.75	0.18	0.9	0.2				
S3-60%	Current	A	2.7	1.9	2.7	1.9				
	Starting burden	kgm^2/h	5.8		4					
	Power factor		0.80	0.67	0.79	0.64				
	Efficiency		0.57	0.24	0.62	0.26				
	Speed	RPM								
	Power	kW								
S3-100%	Current	A								
	Starting burden	kgm^2/h								
	Power factor									
	Efficiency									

Duty type	Motor code		MF10M-104		MF10M-104	
	Speed control		2-speed		2-speed	
	Voltage		380V - 415V		440V - 480V	
	Frequency		50 Hz		60 Hz	
	Brake type		DC		DC	
			fast	slow	fast	slow
	Synchronous speed	RPM	3000	750	3600	900
	Brake torque	Nm	21	21	21	21
	Starting torque	Nm	10	8	10	8
	Electric braking torque	Nm		33/13		33/13
	Starting current	A	12.8	3.0	13.7	3.3
	Maximum torque	Nm	10.3	8	10.3	8
	Speed at max. torque	RPM	1380	0	1650	0
	80% of max. torque	Nm	8	6.4	8	6.4
	Speed at 80% torque	RPM	2380	570	2850	680
	Current at 80% torque	A	5.5	1.7	5.6	1.7
	Inertia	kgm^2	0.0027	0.0027	0.0027	0.0027
	Inertia with flywheel	kgm^2	0.018	0.018	0.018	0.018
	Power factor, starting		0.83	0.84	0.79	0.81
	Weight with fan	kg				
	Weight with flywheel	kg	26	26	26	26
	No-load current	A	1.3	1.2	1.2	1.2
	Iron losses	W				
	Stator resistance at 20 °C	Ω	13.5	69	13.5	69
	Speed	RPM	2500	585	3200	750
	Power	kW	1.5	0.35	1.8	0.4
S3-20%	Current	A	4.6	1.6	3.8	1.6
	Starting burden	kgm^2/h	10		6.9	
	Power factor		0.92	0.77	0.91	0.75
	Efficiency		0.62	0.45	0.68	0.50
	Speed	RPM	2700	630	3310	780
	Power	kW	1.3	0.3	1.5	0.35
S3-40%	Current	A	3.0	1.4	3.0	1.4
	Starting burden	kgm^2/h	8		5.6	
	Power factor		0.89	0.70	0.89	0.68
	Efficiency		0.69	0.47	0.70	0.51
	Speed	RPM	2700	630	3310	780
	Power	kW	1.3	0.3	1.5	0.35
S3-60%	Current	A	3.0	1.4	3.0	1.4
	Starting burden	kgm^2/h	6		4.2	
	Power factor		0.89	0.70	0.89	0.68
	Efficiency		0.69	0.47	0.70	0.51
	Speed	RPM	2700	630	3310	780
	Power	kW	1.3	0.3	1.5	0.35
S3-100%	Current	A	3.0	1.4	3.0	1.4
	Starting burden	kgm^2/h	4		2.8	
	Power factor		0.89	0.70	0.89	0.68
	Efficiency		0.69	0.47	0.70	0.51

4.3 One speed, 3000 RPM (50Hz) and 3600 RPM (60Hz)

Duty type	Motor code		MF06L-100	MF06L-100
	Speed control		**1-speed**	**1-speed**
	Voltage		**380V - 415V**	**440V - 480V**
	Frequency		**50Hz**	**60Hz**
	Brake type		**compact**	**compact**
	Synchronous speed	RPM	3000	3600
	Brake torque	Nm	2	2
	Starting torque	Nm	2.1	2.1
	Electric braking torque	Nm		
	Starting current	A	2.5	2.7
	Maximum torque	Nm	1.8	1.8
	Speed at max. torque	RPM	1830	2550
	80% of max. torque	Nm	1.6	1.6
	Speed at 80% torque	RPM	2180	2790
	Current at 80% torque	A	1.4	1.3
	Inertia	kgm^2	0.0007	0.0007
	Inertia with flywheel	kgm^2		
	Power factor, starting		0.79	0.76
	Weight with fan	kg		
	Weight with flywheel	kg	6.8	6.8
	No-load current	A	0.32	0.32
	Iron losses	W		
	Stator resistance at 20 °C	Ω	62	62
	Speed	RPM	2570	3150
	Power	kW	0.3	0.37
S3-20%	Current	A	1.0	1.0
	Starting burden	kgm^2/h	1.9	1.3
	Power factor		0.83	0.83
	Efficiency		0.57	0.65
	Speed	RPM	2570	3150
	Power	kW	0.3	0.37
S3-40%	Current	A	1.0	1.0
	Starting burden	kgm^2/h	1.7	1.2
	Power factor		0.83	0.83
	Efficiency		0.57	0.65

5 TROLLEY SPEED TABLES

5.1 Inverter control(T), Speed range

Low headroom trolley, Inverter control

Frame	Rope Reeving	Duty			Gear type	Total ratio	Wheel diameter [mm]	Motor type	Pcs	Inverter power	Speed range [m/min][1)]		
											Min	380V-415V Max	460V-480V Max
B	02		M5	M6	GEK 106	34.9	80	MF06MA200	1	MicroMove 007	10	20	24
B	02		M5	M6	GEK 106	34.9	80	MF06MA100	1	MicroMove 007	16	32	32
B	04		M5	M6	GEK 106	34.9	80	MF06MA200	1	MicroMove 007	10	20	24
B	04		M5	M6	GEK 106	34.9	80	MF06MA100	1	MicroMove 007	16	32	32
C	A2		M5	M6	GEK 106	43.7	100	MF06MA200	1	MicroMove 007	10	20	24
C	A2		M5	M6	GEK 106	43.7	100	MF06MA100	1	MicroMove 007	16	32	32
C	A4		M5	M6	GEK 106	43.7	100	MF06MA200	1	MicroMove 007	10	20	24
C	A4		M5	M6	GEK 106	43.7	100	MF06MA100	1	MicroMove 007	16	32	32
C	02	X	M5	M6	GEK 106	43.7	100	MF06LA200	1	MicroMove 007	10	20	24
C	02	X	M5	M6	GEK 106	43.7	100	MF06LA100	1	MicroMove 007	16	32	32
C	04		M5	M6	GEK 106	43.7	100	MF06LA200	1	MicroMove 007	10	20	24
C	04		M5	M6	GEK 106	43.7	100	MF06LA100	1	MicroMove 007	16	32	32
C	04	X			GEK 106	54.8	125	MF06LA200	1	MicroMove 007	10	20	24
C	04	X			GEK 106	54.8	125	MF06LA100	1	MicroMove 007	16	32	32
D	02	X	M5	M6	GEK 106	54.8	125	MF06MA200	2	MicroMove 022	10	20	24
D	02	X	M5	M6	GEK 106	54.8	125	MF06LA100	2	MicroMove 022	16	32	32
D	04		M5	M6	GEK 106	54.8	125	MF06LA200	2	MicroMove 022	10	20	24
D	04		M5	M6	GEK 106	54.8	125	MF06LA100	2	MicroMove 022	16	32	32
D	04	X			GEK 106	54.8	150	MF06LA200	2	MicroMove 022	12.5	25	30
D	04	X			GEK 106	54.8	150	MF06LA100	2	MicroMove 022	20	40	40

[1)] The maximum speed depends on the line voltage. With higher line voltage greater speeds can be achieved.

The table is calculated with maximum loads for the hoists. With derated loads it may be possible to use smaller inverters. In these cases the inverter selection must be verified with KC Drive or Markman.

Normal headroom trolley, Inverter control

Frame	Rope Reeving	Duty			Gear type	Total ratio	Wheel diameter [mm]	Motor type	Pcs	Inverter power	Speed range [m/min][1)]		
											Min	380V-415V Max	460V-480V Max
B	02		M5	M6	GEK 106	43.7	100	MF06LA200	1	MicroMove 007	10	20	24
B	02		M5	M6	GEK 106	43.7	100	MF06LA100	1	MicroMove 007	16	32	32
B	04		M5	M6	GEK 106	43.7	100	MF06LA200	1	MicroMove 007	10	20	24
B	04		M5	M6	GEK 106	43.7	100	MF06LA100	1	MicroMove 007	16	32	32
C	02		M5	M6	GEK 106	43.7	100	MF06LA200	1	MicroMove 007	10	20	24
C	02		M5	M6	GEK 106	43.7	100	MF06LA100	1	MicroMove 007	16	32	32
C	04		M5	M6	GEK 106	43.7	100	MF06LA200	1	MicroMove 007	10	20	24
C	04		M5	M6	GEK 106	43.7	100	MF06LA100	1	MicroMove 022	16	32	32
C	06		M5	M6	GEK 106	43.7	100	MF06MA200	2	MicroMove 007	10	20	24
C	06		M5	M6	GEK 106	43.7	100	MF06LA100	2	MicroMove 022	16	32	32
C	08		M5	M6	GEK 106	43.7	100	MF06LA200	2	MicroMove 022	10	20	24
C	08		M5	M6	GEK 106	43.7	100	MF06LA100	2	MicroMove 022	16	32	32
D	02/22		M5	M6	GEK 106	43.7	100	MF06MA200	2	MicroMove 022	10	20	24
D	02/22		M5	M6	GEK 106	43.7	100	MF06LA100	2	MicroMove 022	16	32	32
D	04/24		M5	M6	GEK 106	43.7	100	MF06LA200	2	MicroMove 022	10	20	24
D	04/24		M5	M6	GEK 106	43.7	100	MF06LA100	2	MicroMove 022	16	32	32
D	06/26		M5	M6	GEK 106	54.8	125	MF06MA200	4	MicroMove 022	10	20	24
D	06/26		M5	M6	GEK 106	54.8	125	MF06LA100	4	TravelMaster 3 003	16	32	32
D	08/28		M5	M6	GEK 106	54.8	125	MF06MA200	4	MicroMove 022	10	20	24
D	08/28		M5	M6	GEK 106	54.8	125	MF06LA100	4	TravelMaster 3 003	16	32	32
E	02/22	M4	M5	M6	GEK 106	54.8	125	MF06LA200	2	MicroMove 022	10	20	25
E	02/22	M4	M5	M6	GEK 106	54.8	125	MF06LA100	2	MicroMove 022	16	32	32
E	04	M4	M5	M6	GES 320	79.6	180	MF06LA200	3	TravelMaster 3 003	10	20	24
E	04	M4	M5	M6	GES 320	79.6	180	MF06LA100	4	TravelMaster 3 004	16	32	32
E	24	M4	M5	M6	GEK 106	54.8	125	MF06LA200	3	TravelMaster 3 003	10	20	24
E	24	M4	M5	M6	GEK 106	54.8	125	MF06LA100	4	TravelMaster 3 004	16	32	32
E	06/26	M4	M5	M6	GES 320	79.6	180	MF06LA200	3	TravelMaster 3 004	10	20	24
E	06/26	M4	M5	M6	GES 320	79.6	180	MF06LA100	4	TravelMaster 3 005	16	32	32
E	08/28	M4	M5		GES 320	79.6	180	MF06LA200	4	TravelMaster 3 004	10	20	24

[1)] The maximum speed depends on the line voltage. With higher line voltage greater speeds can be achieved.

The table is calculated with maximum loads for the hoists. With derated loads it may be possible to use smaller inverters. In these cases the inverter selection must be verified with KC Drive or Markman.

Double girder trolley, Inverter control

Frame	Rope reeving	Load	End truck	Pcs	Gear	Motor	Inverter	Speed Range [m/min][1)]			Note
								Min	380V-415V Max	460V-480V Max	
B	02	1.6t 2m	ET 09	1x	GES 342	MF06MA200	MicroMove 007	10	20	24	
B	02	1.6t 2m	ET 09	1x	GES 342	MF06MA100	MicroMove 007	16	32	32	
B	04	3.2t 2m	ET 09	1x	GES 342	MF06MA200	MicroMove 007	10	20	24	
B	04	3.2t 2m	ET 09	1x	GES 342	MF06MA100	MicroMove 007	16	32	32	
C	02	3.2t 1Am	ET 09	1x	GES 342	MF06LA200	MicroMove 007	10	20	24	
C	02	3.2t 1Am	ET 09	1x	GES 342	MF06LA100	MicroMove 007	16	32	32	
C	04	5t 2m	ET 09	1x	GES 342	MF06LA200	MicroMove 007	10	20	24	
C	04	5t 2m	ET 09	1x	GES 342	MF06LA100	MicroMove 007	16	32	32	
C	04	6.3t 1Am	ET 09	1x	GES 342	MF06LA200	MicroMove 007	10	20	24	
C	04	6.3t 1Am	ET 09	1x	GES 342	MF06LA100	MicroMove 022	16	32	32	
C	06	7.5t 2m	ET 11	2x	GES 342	MF06MA200	MicroMove 007	10	20	24	
C	06	7.5t 2m	ET 11	2x	GES 342	MF06LA100	MicroMove 022	20	40	40	
C	08	10t 1Am	ET 11	2x	GES 342	MF06MA200	MicroMove 022	10	20	24	
C	08	10t 1Am	ET 11	2x	GES 342	MF06LA100	MicroMove 022	20	40	40	
D	02/22	6.3t 1Am	ET 11	2x	GES 342	MF06MA200	MicroMove 007	10	20	24	
D	02/22	6.3t 1Am	ET 11	2x	GES 342	MF06LA100	MicroMove 022	20	40	40	
D	04/24	10t 2m	ET 11	2x	GES 342	MF06MA200	MicroMove 022	10	20	24	
D	04/24	10t 2m	ET 11	2x	GES 342	MF06LA100	MicroMove 022	20	40	40	
D	04	12.5t 1Am	ET 11	2x	GES 342	MF06LA200	MicroMove 022	10	20	24	
D	04	12.5t 1Am	ET 11	2x	GES 342	MF06LA100	MicroMove 022	20	40	40	
D	06/26	15t 2m	ET 14	2x	GES 342	MF06LA20P	MicroMove 022	15	32	32	
D	08/28	20t 1Am	ET 14	2x	GES 342	MF06LA20P	TravelMaster 3 003	10	32	32	
D	08/28	20t 1Am	ET 20	2x	GES 490	MF06LB100	TravelMaster 3 003	10	32	32	*
E	02/22	10t 1Am	ET 14	2x	GES 342	MF06LA200	MicroMove 022	16	32	32	
E	04/24	20t 1Am	ET 14	2x	GES 342	MF06LA20P	TravelMaster 3 003	10	25	25	
E	04/24	20t 1Am	ET 20	2x	GES 490	MF06LB100	TravelMaster 3 003	10	32	32	*
E	06/26	30t 1Am	ET 20	2x	GES 490	MF06LA20P	MicroMove 022	10	20	24	
E	06/26	30t 1Am	ET 20	2x	GES 490	MF06LB100	TravelMaster 3 003	10	32	32	
E	08/28	40t 1Am	ET 20	2x	GES 490	MF06LB200	TravelMaster 3 003	10	20	24	
E	08/28	40t 1Am	ET 20	2x	GES 490	MF06LB100	TravelMaster 3 004	10	32	32	
F	22	20t 1Am	ET 20	2x	GES 490	MF06LA200	MicroMove 022	10	20	24	
F	22	20t 1Am	ET 20	2x	GES 490	MF06LB100	TravelMaster 3 003	10	32	32	
F	24	40t 1Am	ET 20	2x	GES 490	MF06LB200	TravelMaster 3 003	10	20	24	
F	24	40t 1Am	ET 20	2x	GES 490	MF06LB100	TravelMaster 3 004	10	32	32	
F	26	60t 1Am	ET 25	2x	GES 590	MF07XA200	TravelMaster 3 005	10	25	25	
F	26	60t 1Am	ET 25	2x	GES 572	MF07XA200	TravelMaster 3 007	10	32	32	
F	28	80t 1Am	ET 25x6	2x	GES 590	MF07XA200	TravelMaster 3 007	10	25	25	
F	28	80t 1Am	ET 25x6	2x	GES 572	MF07XB200	TravelMaster 3 011	10	32	32	

OPTIONAL SPEED

*) Oversized end truck

[1)] The maximum speed depends on the line voltage. With higher line voltage greater speeds can be achieved.

The table is calculated with maximum loads for the hoists. With derated loads it may be possible to use smaller inverters. In these cases the inverter selection must be verified with KC Drive or Markman.

Contactor control (P), Speeds

Low headroom trolley, Contactor control

Frame	Rope Falls	Duty			Gear type	Motor type	Total ratio	Whl. diam. [mm]	Pcs	50 Hz				60 Hz			
										Max speed		Min speed		Max speed		Min speed	
										Trl Spd [m/min]	Sync. Mot. Speed [rpm]	Trl Spd [m/min]	Sync. Mot. Speed [rpm]	Trl Spd [m/min]	Sync. Mot. Speed [rpm]	Trl Spd [m/min]	Sync. Mot. Speed [rpm]
Z	2		M5	M6	GEK 106PT1B0	MF06MA104	34.9	80	1	20	3000	5	750	24	3600	6	900
Z	4		M5	M6	GEK 106PT1B0	MF06MA104	34.9	80	1	20	3000	5	750	24	3600	6	900
Z	2		M5	M6	GEK 106PT1B0	MF06L-100	34.9	80	1	20	3000		*)	24	3600		*)
Z	4		M5	M6	GEK 106PT1B0	MF06L-100	34.9	80	1	20	3000		*)	24	3600		*)
B	02		M5	M6	GEK 106PT1B0	MF06MA104	34.9	80	1	20	3000	5	750	24	3600	6	900
B	04		M5	M6	GEK 106PT1B0	MF06MA104	34.9	80	1	20	3000	5	750	24	3600	6	900
C	A2		M5	M6	GEK 106PT1B0	MF06MA104	43.7	100	1	20	3000	5	750	24	3600	6	900
C	A4		M5	M6	GEK 106PT1B0	MF06MA104	43.7	100	1	20	3000	5	750	24	3600	6	900
C	02	X	M5	M6	GEK 106PT1B0	MF06MA104	43.7	100	1	20	3000	5	750	24	3600	6	900
C	04	X	M5	M6	GEK 106PT1B0	MF06MA104	43.7	100	1	20	3000	5	750	24	3600	6	900
D	02	X	M5	M6	GEK 106PT1B0	MF06MA104	54.8	125	2	20	3000	5	750	24	3600	6	900
D	04		M5	M6	GEK 106PT1B0	MF06MA104	54.8	125	2	20	3000	5	750	24	3600	6	900
D	04	X			GEK 106PT1B0	MF06LA104	54.8	150	2	24	3000	6	750	29	3600	7	900

*) One-speed motor

Normal headroom trolley, Contactor control

Frame	Rope Falls	Duty			Gear type	Motor type	Total ratio	Whl. diam. [mm]	Pcs	50 Hz				60 Hz			
										Max speed		Min speed		Max speed		Min speed	
										Trl Spd [m/min]	Sync. Mot. Speed [rpm]	Trl Spd [m/min]	Sync. Mot. Speed [rpm]	Trl Spd [m/min]	Sync. Mot. Speed [rpm]	Trl Spd [m/min]	Sync. Mot. Speed [rpm]
B	02		M5	M6	GEK 106PT1B0	MF06LA104	43.7	100	1	20	3000	5	750	24	3600	6	900
B	04		M5	M6	GEK 106PT1B0	MF06LA104	43.7	100	1	20	3000	5	750	24	3600	6	900
C	02		M5	M6	GEK 106PT1B0	MF06LA104	43.7	100	1	20	3000	5	750	24	3600	6	900
C	04		M5	M6	GEK 106PT1B0	MF06LA104	43.7	100	1	20	3000	5	750	24	3600	6	900
C	06		M5	M6	GEK 106PT1B0	MF06MA104	43.7	100	2	20	3000	5	750	24	3600	6	900
C	08	M4			GEK 106PT1B0	MF06MA104	43.7	100	2	20	3000	5	750	24	3600	6	900
D	02/22		M5	M6	GEK 106PT1B0	MF06MA104	43.7	100	2	20	3000	5	750	24	3600	6	900
D	04/24		M5	M6	GEK 106PT1B0	MF06MA104	43.7	100	2	20	3000	5	750	24	3600	6	900
D	06/26		M5		GEK 106PT1B0	MF06MA104	54.8	125	4	20	3000	5	750	24	3600	6	900
D	08/28	M4			GEK 106PT1B0	MF06MA104	54.8	125	4	20	3000	5	750	24	3600	6	900
E	02/22	M4	M5	M6	GEK 106PT1B0	MF06LA104	54.8	125	2	20	3000	5	750	24	3600	6	900
E	04	M4	M5	M6	GES 320PT3BO	MF06LA104	79.6	180	3	20	3000	5	750	24	3600	6	900
E	24	M4	M5	M6	GEK 106PT1B0	MF06LA104	54.8	125	3	20	3000	5	750	24	3600	6	900
E	06/26	M4	M5	M6	GES 320PT3BO	MF06LA104	79.6	180	3	20	3000	5	750	24	3600	6	900
E	08/28		M5	M6	GES 320PT3BO	MF06LA104	79.6	180	4	20	3000	5	750	24	3600	6	900

Double girder trolley, Contactor control

Frame	Rope reeving	Load	End truck		Pcs	Gear		Motor	Speed 50Hz		Speed 60Hz		Note!
									High	Low	High	Low	
B	02	1.6t 2m	ET	9	1x	GES	342	MF06MA104	20	5	24	6	
B	04	3.2t 2m	ET	9	1x	GES	342	MF06MA104	20	5	24	6	
C	02	3.2t 1Am	ET	9	1x	GES	342	MF06MA104	20	5	24	6	
C	04	6.3t 1Am	ET	9	1x	GES	342	MF06LA104	20	5	24	6	
C	06	7.5t 2m	ET	11	2x	GES	342	MF06MA104	20	5	24	6	
C	08	10t 1Am	ET	11	2x	GES	342	MF06MA104	20	5	24	6	
D	02/22	6.3t 1Am	ET	11	2x	GES	342	MF06MA104	20	5	24	6	
D	04/24	12.5t 1Am	ET	11	2x	GES	342	MF06LA104	20	5	24	6	
D	06/26	15t 2m	ET	20	2x	GES	490	MF06LA104	20	5	24	6	*
D	08/28	20t 1Am	ET	20	2x	GES	490	MF06LA104	20	5	24	6	*
E	02/22	10t 1Am	ET	20	2x	GES	490	MF06LA104	20	5	24	6	*
E	04/24	20t 1Am	ET	20	2x	GES	490	MF06LA104	20	5	24	6	*
E	06/26	30t 1Am	ET	25	2x	GES	5B5	MF07X-104	20	5	24	6	*
E	08/28	40t 1Am	ET	25	2x	GES	5B5	MF07X-104	20	5	24	6	*
F	22	20t 1Am	ET	20	2x	GES	490	MF06LA104	20	5	24	6	
F	24	40t 1Am	ET	25	2x	GES	5B5	MF07X-104	20	5	24	6	*
F	26	60t 1Am	ET	25	2x	GES	5B5	MF10M-104	20	5	24	6	
F	28	80t 1Am	ET	25x6	2x	GES	5B5	MF10M-104	20	5	24	6	

*****) Note:Trolley higher than with inverter travelling, consult factory for further information.

6 SURFACE TREATMENT

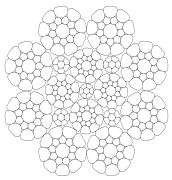
6.1 Standard painting system

	Wet painting		Alternative: Powder coating	
Product group	Load carrying steel parts	Outfitting steel parts	Load carrying steel parts	Outfitting steel parts
Parts and components Etc.	End plate Support beam Pulley support Hook forging Hookd side plate Trolley	Cover	End plate Support beam Pulley support Hook forging Hookd side plate Trolley	Cover
Class	C3L		C3L	
Standard/ Painting system	SFS-EN ISO 12944-5 EP120/2-FeSa2½	SFS-EN ISO 12944-5 EP120/2-FeSa2½	SFS-EN ISO 12944-5 PE 80/1	SFS-EN ISO 12944-5 PE 80/1
Steel work	05 (SFS 8145)	05 (SFS 8145)	05 (SFS 8145)	05 (SFS 8145)
Preliminary treatment	Wash, removal of grease Shot blasting Sa2½	Wash, removal of grease Zinc- or ironphosphate	Wash, removal of grease Zinc- or ironphosphate	Wash, removal of grease Zinc- or ironphosphate
Priming paint	Epoxy priming paint 1x60 µm	Epoxy priming paint 1x60 µm		
Finishing paint	Epoxy finishing paint 1x60 µm	Epoxy finishing paint 1x60 µm	Epoxy polyester powder coating 1x80 µm	Epoxy polyester powder coating 1x80 µm
Total paint thickness	120 µm	120 µm	80 µm	80 µm

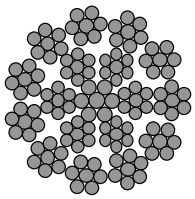
6.2 Color codes

Part	Color code
	S
Hoisting unit	
Hoist frame	RAL 7021
Frame cover	RAL 9006
Hoist motor (frame)	Aluminum
Hoist motor (fan cover)	RAL 7021
Hoist gear (frame)	RAL 7021
Junction box	
Plastic	RAL 7016
Steel	RAL 7021
Rope reeving	
Hook forging	RAL 7021
Cross bar	RAL 7021/Zinced
Hook sheave cover plate	RAL 1021
Locking plate	RAL 7021
Sheave	RAL 7021
Sheave support	RAL 7021
Rope guide	RAL 7021
Electrical cubicle	
Cubicle bottom	RAL 7021
Cubicle cover (QA/QB-L/N)	RAL 9006
Cubicle cover (others)	RAL 9006
Cubicle support (Low headroom)	RAL 7021
Back plate (Low headroom)	RAL 9006
Counterweight	RAL 7021
Trolley	
All Trolley types	RAL 7021
Travelling machinery	
Travel motor (frame)	Anodised (black)
Travel gear (frame)	RAL 7021
Travel wheel	RAL 7021
Color	
RAL 1021	Cadmium yellow
RAL 7016	Dark grey
RAL 7021	Black grey
RAL 9006	White aluminium
DZ 2369	Green peppermint

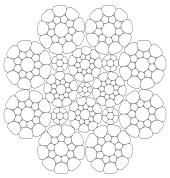
7 WIRE ROPE DATA



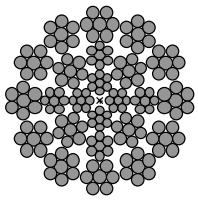
Cross section
Rope type: A



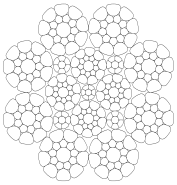
Cross section
Rope type: B



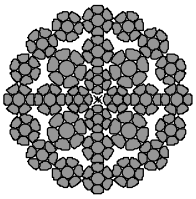
Cross section
Rope type: D and Dr



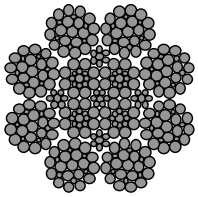
Cross section
Rope type: F and Y



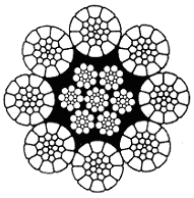
Cross section
Rope type: G and Gr



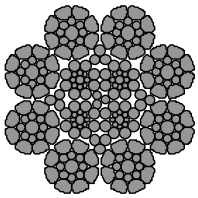
Cross section
Rope type: J, Z and M



Cross section
Rope type: K and Kr



Cross section
Rope type: C, E, Er, H, Hr, L, Lr



Cross section
Rope type: N

Rope	Dia. mm	Minimum Breaking Load kN	Calculated Breaking Load kN	Strand Constr.	Wire Strength N/mm2	Core	Rope Lay	Comp. Outer Strands	Wire Material	Weight kg/m	Rot. resist.
N	6.2	36.4	45.5	8 x 17	2160	Steel core parallel strands	LO	Yes	Galvanized steel	0.17	No
A	6.4	43.7	51.4	8 x 19	2160	Steel core parallel strands	LO	Yes	Galvanized steel	0.2	No
B	6.7	37.0	47.4	17 x 7	2160	Steel core	LO	No	Galvanized steel	0.18	Yes
D	8	68.9	81.1	8 x 19	2160	Steel core parallel strands	LO	Yes	Galvanized steel	0.33	No
Dr	8	68.9	81.1	8 x 19	2160	Steel core parallel strands	RO	Yes	Galvanized steel	0.33	No
F	8	56.0	66.0	24 x 7	2160	Steel core	LL	No	Galvanized steel	0.27	Yes
Y	8.5	63.5	80.0	24 x 7	2160	Steel core	LL	No	Galvanized steel	0.32	Yes
G	11	127.2	149.7	8 x 19	2160	Steel core parallel strands	LO	Yes	Galvanized steel	0.62	No
Gr	11	127.2	149.7	8 x 19	2160	Steel core parallel strands	RO	Yes	Galvanized steel	0.62	No
J	11	115.0	137.3	28 x 7	2160	Steel core	LO	Yes	Galvanized steel	0.56	Yes
Z	11.5	125.0	150.3	28 x 7	2160	Steel core	LO	Yes	Galvanized steel	0.61	Yes
K	15	221.6	257.5	8 x 25	2160	Steel core parallel strands	LO	No	Galvanized steel	1.03	No
Kr	15	221.6	257.5	8 x 25	2160	Steel core parallel strands	RO	No	Galvanized steel	1.03	No
M	15	218	249.0	28 x 7	2160	Steel core	LO	Yes	Galvanized steel	1.03	Yes
C	6.5	36.7	43.2	8 x 19	1960	Independent wire rope core	LO	Yes	Galvanized steel	0.2	No
E	8	65.6	78.1	8 x 19	2160	Independent wire rope core	LO	Yes	Galvanized steel	0.33	No
Er	8	65.6	78.1	8 x 19	2160	Independent wire rope core	RO	Yes	Galvanized steel	0.33	No
H	11	128	152	8 x 19	2160	Independent wire rope core	LO	Yes	Galvanized steel	0.63	No
Hr	11	128	152	8 x 19	2160	Independent wire rope core	RO	Yes	Galvanized steel	0.63	No
L	15	229	273	8 x 26	2160	Independent wire rope core	LO	Yes	Galvanized steel	1.14	No
Lr	15	229	273	8 x 26	2160	Independent wire rope core	RO	Yes	Galvanized steel	1.14	No

LO = left hand ordinary lay, **RO** = right hand ordinary lay, **LL** = left hand Lang's lay

8 MATERIALS

FIGURE	Part	Fabrication method							Material									Material		Standard finishing			
		1 Cast 2 Forged 3 Extruded 4 Stamped 5 Flame cut 6 Machined 7 Hardened							1 Steel 2 Steel plate 3 Case-hardening steel 4 Quenched and tempered steel 5 Spherical cast iron 6 Grey cast iron 7 Acid-proof steel 8 Aluminium 9 Plastic / rubber											1 Epoxy paint 2 Zinc elektroplating 3 Anodised 4 Nitrated			
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	Description	Standard	1	2	3	4
FA/B	**HOIST FRAME**																						
A4	Drum						•		•									S355J2	EN10025				
B6	Drum Cover																•	POM					
B3	Drum seal ring																•	POM					
	Sealing																•	Felt PL3					
A7	Rope guide	•					•						•					EN-GJS-500-7	EN1563	•			
	Rope Guide, Plate, Z																•	POM					
B4	Frame rods						•		•									S355J2	EN10025	•			
A1	Frame ends, A,B,C				•				•									S355MC	EN10149	•			
	Frame ends, D,E				•		•		•									S355J2	EN10025	•			
	Frame protection cover				•					•								DC01	EN10130	•			
B2	Bearing part, A,B,C,Z																•	POM					
B1	Slide Part																•	PE-UHMW					
A3	Junction box																•	PBT/PC	Pocan				
	Junction box seal																•	PUR					
	Cable duct																•	PA6					
	Cable duct clamp																•	PA					
FC	**HOOK BLOCK**																						
	Hook forging		•				•					•						34CrMo4	EN10083	•			
C1	Hook forging		•				•					•						34CrNiMo6	EN10083	•			
C2	Hook block housing, A,B,C, when 04 rope falls				•				•									S355MC	EN10149	•			
C2	Cross bar						•		•									S355J2	EN10025	•			
C3	Sheave cover				•					•								DC03	EN10130	•			
FC	**ROPE SHEAVE BLOCK**																						
C4	Rope sheaves	•					•						•					EN-GJS-700-3	EN1563	•			
C5	Rope sheave shafts						•		•									S355J2	EN10025		•		
C6	Suspension beam					•	•		•									S355J2	EN10025		•		
FD	**ROPE ANCHORAGE**																						
D1	Rope clamps						•		•									S355J2	EN10025		•		
D2	Wedge housing	•											•					EN-GJS-500-7	EN1563	•			
D3	Wedge	•											•					EN-GJS-500-7	EN1563	•			
D4	Wedge housing shaft						•					•						S355J2	EN10025				
FD	**OVERLOAD DEVICE**																						
D5	Beam								•									S355J2	EN10025		•		
D6	U-Beam								•									S235J2	EN10025		•		
D7	Bearing								•									S355J2	DIN2448		•		
D8	Fixing plate, D,E									•								DC01	EN10131		•		
D9	Limit switch mechanical																•	PC,PVC					
D10	Limit switch back up																•	fibre reinforced PA, POM					

D9	Strain Gauge																Silicone rubber, PVC, High Strength Low Alloy or Aluminium					
FA	**HOISTING GEARBOX**																					
A2	Gearbox housing, A,B	•					•									•	EN AC-AlSi7Mg	EN1706	•			
	Gearbox housing, C,D,E	•					•					•					EN-GJS-500-7	EN1563	•			
	Gear wheels						•	•			•						AISI 8620	AISI 8620				
	Shafts inside gearbox						•	•			•						AISI 8620	AISI 8620				
	O-ring															•	NBR					
	Coupling						•		•								S355J2	EN10025				
FG	**HOISTING MOTORS**																					
G1	Fan cover															•	PP					
G2	Motor fan															•	PA					
G3	Motor frame			•			•								•		EN AW-AlMgSi	EN573				
G6	Friction plate								•								S355J2	EN10025				
G4	Rotor shaft						•				•						42CrMo4	EN10083				
	Wires															•	Silicon rubber, Fibreglass braid					
G5	Mounting flange	•					•								•		EN AC-AlSi10Mg(a)	EN1706				
	Mounting flange, motor MF13	•					•						•				EN-GJL-200	EN1561	•			
FE	**TRAVELLING GEARBOX**																					
E10	Gearbox housing	•					•								•		EN AC-AlSi10Mg(a)	EN1706	•			
	Gear wheels						•	•			•						Steel Alloy	AISI 8620				
	Gearbox shafts						•	•			•						Steel Alloy	AISI 8620				
FE	**TRAVELLING MOTOR**																					
E2	Motor frame			•			•								•		EN AW-AlMgSi	EN573			•	
E6	Rotor shaft						•				•						42CrMo4	EN10083				
E8	Plug cover															•	PPE+PS	Noryl				
E9	Terminal box																PPE+PS	Noryl				
E7	Motor cover															•	PPE+PS	Noryl				
E4	Brake wheel									•							DC01	EN10130		•		
E3	Friction disc														•		EN AW-AlMg3	EN573				
E5	Aluminium ring														•		EN AW-AlMgSi	EN573				
	Wires															•	Silicon rubber, Fibreglass braid					
E1	Mounting flange	•					•						•				EN AW-AlSi10Mg	EN1706				
	POWER SUPPLY																					
	Cable, plastic															•	PVC					
	Cable, rubber															•	EPDM					
	Cable gland															•	PA6.6/Neoprene					
	Cable ties, black															•	PA 6/6					
	Cable ties, green															•	PP					
	Plug housing															•	PBT/PC	Pocan				
	Sealing for plug cover															•	EPDM					
	C-Rails									•							S235JR	EN10025		•		
	PENDANT																					
	Cover															•	ABS+PC	Cycoloy C2800				
	Micro switch															•	PA66					
	Buttons															•	ABS, NBR					
FA	**ELECTRICAL PANEL**																					
	CID unit															•	PC					
	Inverter cover															•	PC					

	Control Pro																•	PC				
	ESD142																•	PA				
	Cable gland / Gasket																•	PA / Neoprene				
	Contactor																•	Thermoplastic				
	Terminal strip																•	PA	Wemid			
	Wrapped wire																•	PVC V2				
A5	Enclosure				•					•								DC01	EN10130	•			
	Enclosure sealing																	EPDM					
	LOW HEADROOM TROLLEY																						
	Frame beams						•		•									S355J2	EN10025		•		
	Frame plates				•		•		•									S355J2	EN10025	•			
	Travel wheel shafts						•		•									S355J2	EN10025		•		
	Travel wheels	•										•						EN-GJS-700-3	EN1563	•			
	Counter weight					•			•									S235JR	EN10025	•			
	Grease, Plug cover, A,B,C																•	PA				
	Tube end																•	PA				
	Buffer																•	NR				
	NORMAL HEADROOM TROLLEY																						
	Trolley plates					•	•		•									S355J2	EN10025	•			
	Trolley suspension frame					•	•		•									S355J2	EN10025	•			
	Trolley suspension shaft. b<420						•					•						S355J2	EN10025		•		
	Trolley suspension shaft, b>420						•					•						42CrMo4	EN10083		•		
	Travel wheels	•											•					EN-GJS-700-3	EN1563	•			
	Travel wheel shafts						•		•									S355J2	EN10025				
	Buffer																•	NR				
	DOUBLE GIRDER TROLLEY																						
	Trolley wheels	•											•					EN-GJS-700-2	EN1563	•			
	Trolley wheel shafts*						•		•									S355J2	EN10025				
	Trolley wheel supports*	•											•					EN-GJS-500-7	EN1563	•			
	Trolley end carriages						•		•									S355J2	EN10025	•			
	Intermediate beam						•		•									S355J2	EN10025	•			
	Buffer																•	NR				

*) If any

	LIMIT SWITCHES	
	Travelling limit switch / 1 step	Zamak Zn-dope, Al Alloy (ET6060T5), NBR
	Travelling limit switch / 2 step	Zamak Zn-dope, Al Alloy (ET6060T5), NBR
	Travelling limit switch / Magnet	AlSi12, painted, lacquered
	Manual reset extra stop limit switch	PA66 / PA6.66, Delrin 500, NBR,
	Light shell anti-collision travelling limit switch	ABS, PMMA, PVC
	Light shell anti-collision travelling limit switch	Al, glass
	Ultrasonic limit switch	PBT, Nickel-plated Brass, fibre reinforced PUR-EP
	Hoisting limit switch (TER)	PA66 25%, AISI 303, POM Delrin 500, PC Lexan

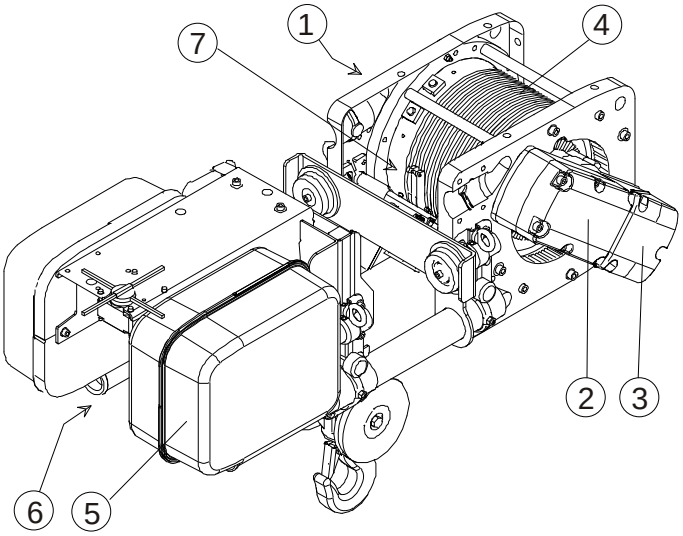


Figure A

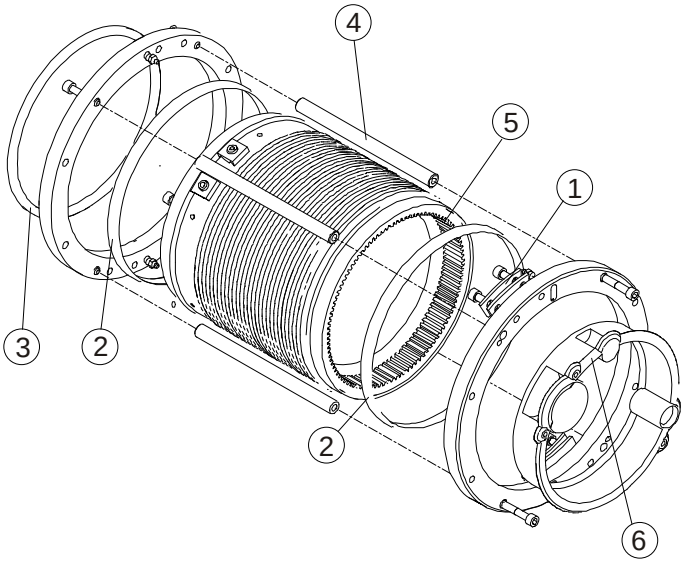


Figure B

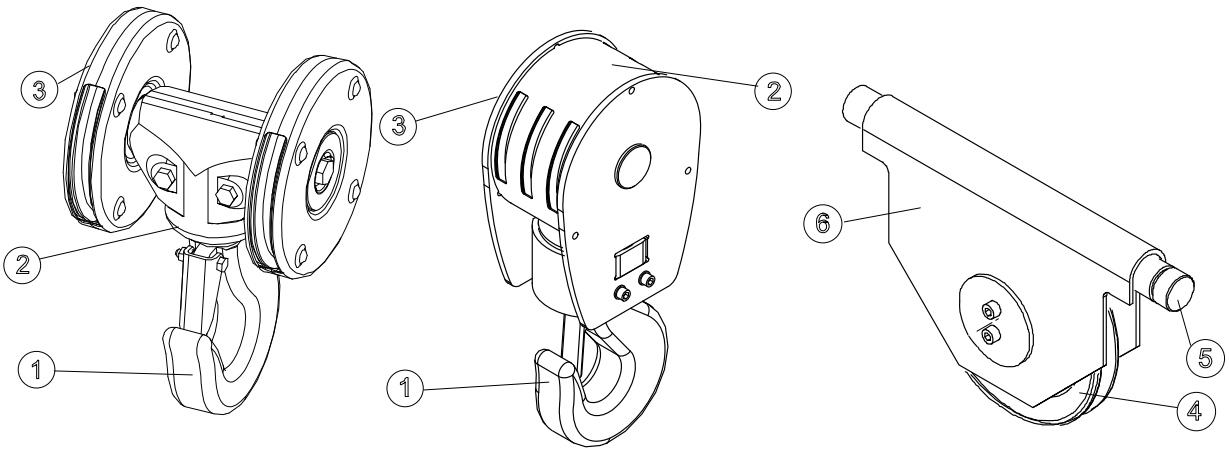


Figure C

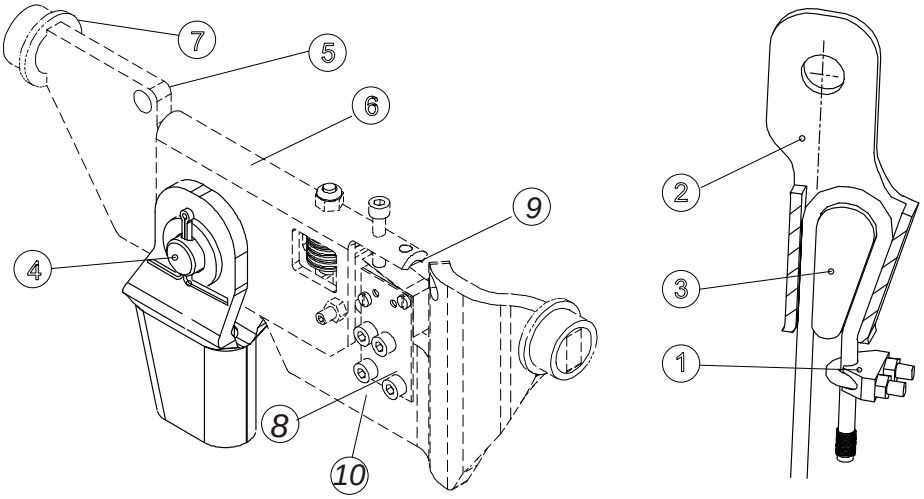


Figure D

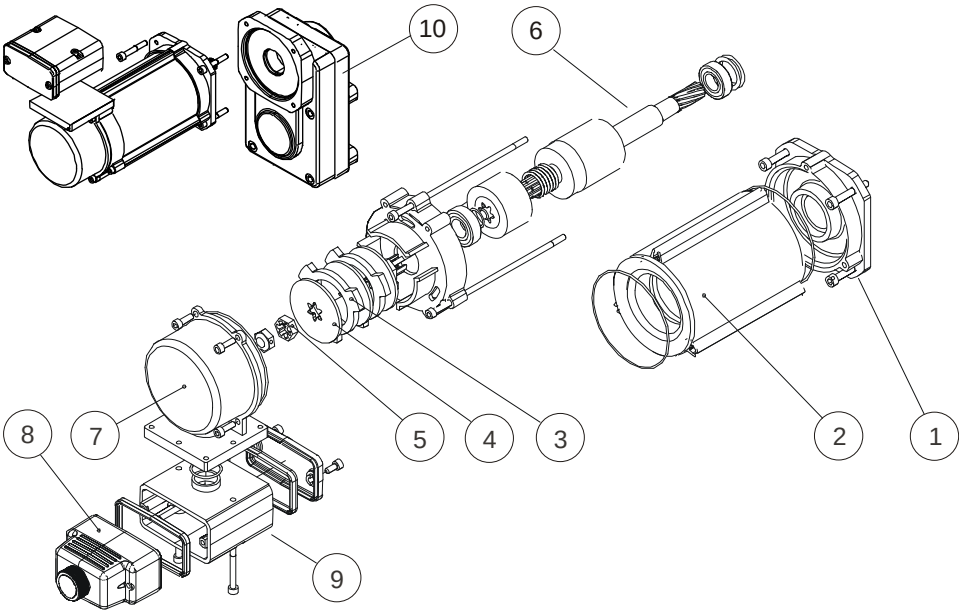


Figure E

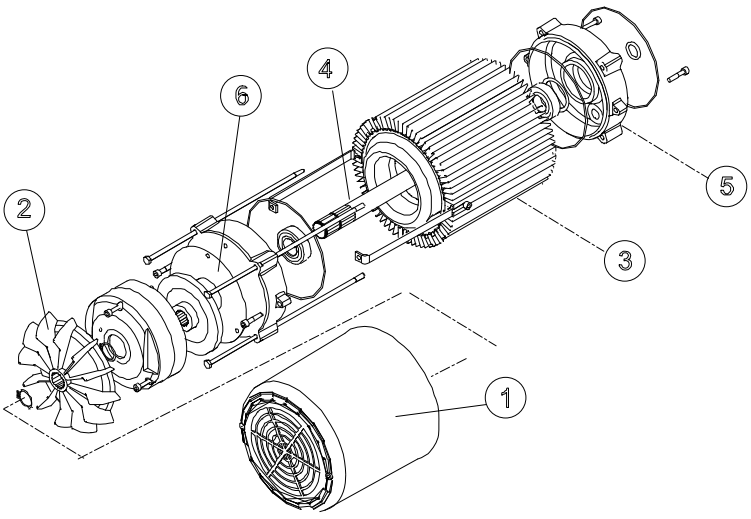


Figure F

9 HOOK

9.1 Hook block dimensions

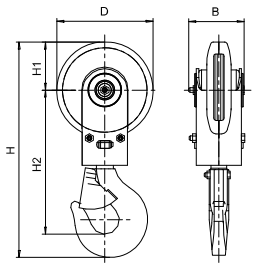


Figure 1

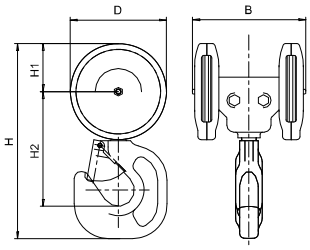


Figure 2

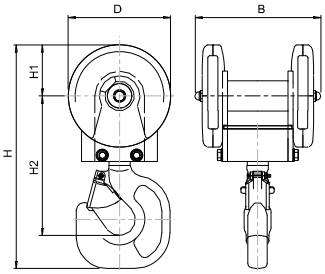


Figure 3

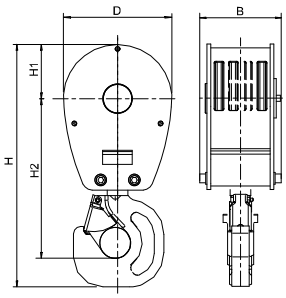


Figure 4

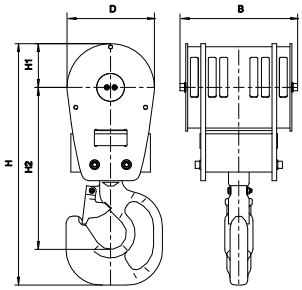


Figure 5

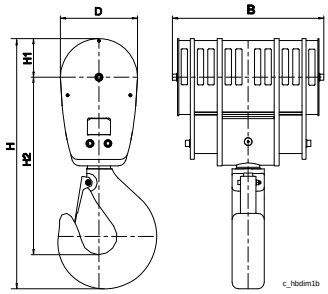


Figure 6

Hoist frame	Rope falls	Hoist duty			Hook forging	Fig.	Hook block dimensions (mm)					Weight (kg)
		1Am/M4	2m/M5	3m/M6			H	H1	H2	D	B	
Z	02		M5		RSN1 V	1	385	84	261	168	108	9.3
Z	04		M5		RSN1.6 V	3	391	84	258	168	202	16.2
B	02		M5	M6	RSN 1 V	1	385	84	261	168	108	9.3
B	04		M5	M6	HBC 1.6 V	2	337	84	198	168	221	13
C	02	X (M4)	M5	M6	RSN 1 V	1	425	102	282	204	118	14
C	04		M5	M6	HBC 2.5 V	2	426	102	259	204	270	22
C	04	X (M4)			HBC 2.5 V	3	443	102	276	204	241	31.5
C	06		M5	M6	HBC 2.5 V	4	499	110	324	220	165	37
C	08	M4	M5		HBC 2.5 V	4	499	110	324	220	165	40
D	02	X (M4)	M5	M6	HBC 2.5 V	1	578	142	371	283	148	31
D	04		M5	M6	HBC 5 V	2	548	142	316	283	376	46.5
D	04	X (M4)			HBC 5 V	3	604	142	372	283	341	77.5
D	06		M5	M6	HBC 5 V	4	687	150	447	300	220	88
D	08	M4	M5		HBC 5 V	4	687	150	447	300	220	95
D	22		M5	M6	HBC 2.5 V	4	499	110	324	220	165	29
D	24		M5	M6	HBC 5 V	5	608	110	408	220	220	67
D	26		M5	M6	RSN 6 V	5	644	110	448	220	286	80
D	28	M4	M5		RSN 6 V	5	644	110	448	220	344	88
E	02	M4	M5	M6	HBC 5 V	4	788	198	500	395	226	95
E	04	M4	M5	M6	HBC 5 V	4	788	198	500	395	226	107
E	06	M4	M5	M6	RSN10 T	4	930	198	625	395	259	182
E	08	M4	M5		RSN 16 T	5	1067	198	735	395	289	259
E	22	M4	M5	M6	HBC 5 V	4	687	150	447	300	224	90
E	24	M4	M5	M6	HBC 5 V	4	717	170	457	340	271	125
E	26	M4	M5	M6	RSN10 T	5	862	170	585	340	405	240
E	28	M4	M5		RSN 16 T	6	999	170	695	300	487	306
F	22	M4	M5	M6	HBC 5 V	4	788	198	500	395	219	107
F	24	M4	M5	M6	RSN 16 T	5	1114	228	753	455	335	309
F	26	M4	M5	M6	RSN 20 T	5	1201	228	822	455	487	485
F	28	M4	M5		RSN 25 T	6	1285	228	886	455	579	587

9.2 Hook block dimensions

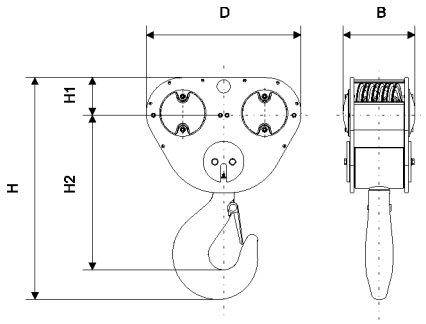


Figure 7

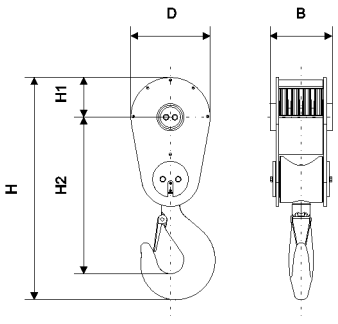


Figure 8

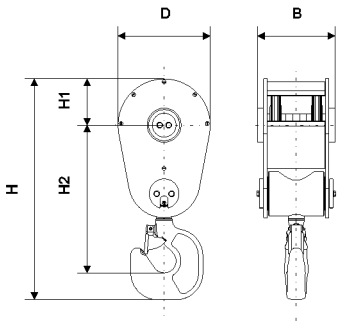
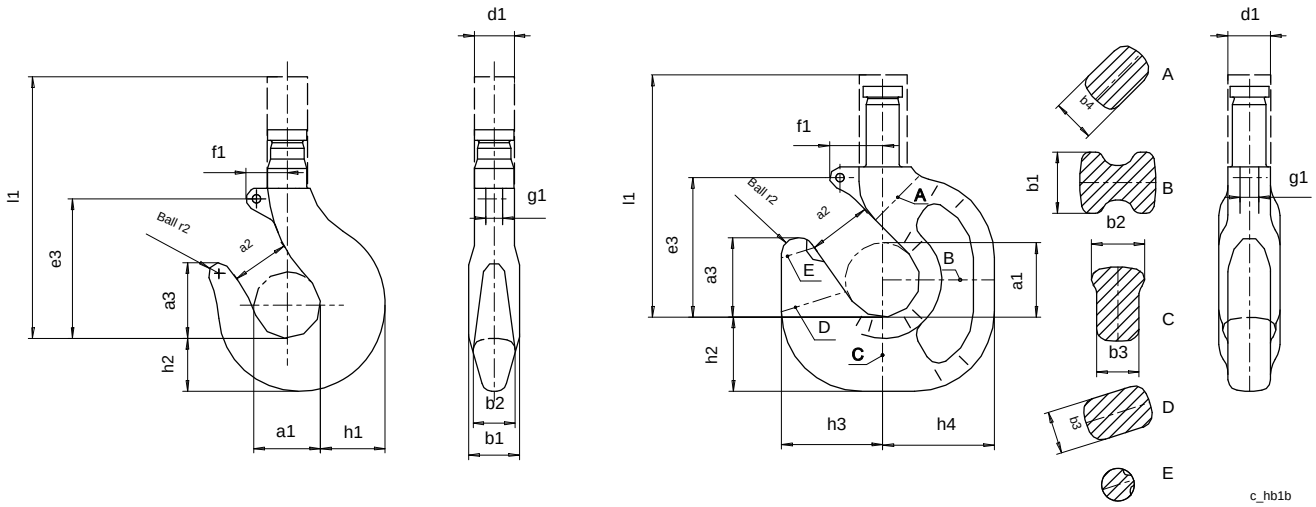


Figure 9

Hoist frame	Rope falls	Hoist duty			Hook forging	Fig.	Hook block dimensions (mm)					Weight (kg)
		1Am/M4	2m/M5	3m/M6			H	H1	H2	D	B	
E	02	M4	M5	M6	HBC 5 V	9	830	205	535	410	280	98
E	04	M4	M5	M6	HBC 5 V	9	830	205	535	410	280	111
E	06	M4	M5	M6	RSN10 T	8	996	205	684	410	314	181
E	08	M4	M5		RSN 16 T	8	1126	205	787	410	322	236
E	22	M4	M5	M6	HBC 5 V	9	740	155	495	310	259	78
E	24	M4	M5	M6	RSN 6 V	7	719	160	473	700	312	143
E	26	M4	M5	M6	RSN10 T	7	861	160	594	700	316	192
E	28	M4	M5		RSN 16 T	7	981	160	687	700	324	299
F	22	M4	M5	M6	RSN 6 V	8	844	205	553	410	280	114
F	24	M4	M5	M6	RSN 16 T	7	1041	200	707	910	393	332
F	26	M4	M5	M6	RSN 20 T	7	1130	200	778	910	402	495
F	28	M4	M5		RSN 25 T	7	1224	200	852	910	411	603

Note: These hook blocks enter production in 2010. Consult the factory for availability.

9.3 Hook forging dimensions



RSN HBC

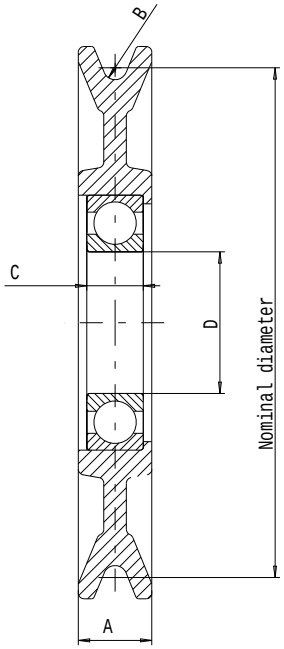
	RSN										HBC		
	RSN 1	**RSN 1.6**	**RSN 2.5**	**RSN 4**	**RSN 5**	**RSN 6**	**RSN 10**	**RSN 16**	**RSN 20**	**RSN 25**	**HBC 1.6**	**HBC 2.5**	**HBC 5**
a_1	50 + 3	56 + 3	63 + 3	71 + 4	80 + 4	90 + 5	112 + 6	140 + 6	160 + 8	180 + 8	56 + 3	63 + 3	80 + 3
a_2	40 + 3	45 + 3	50 + 3	56 + 4	63 + 4	71 + 5	90 + 6	112 + 6	125 + 8	140 + 8	45 + 3	51 + 3	63 + 3
a_3	57 + 3	64 + 3	72 + 3	80 + 4	90 + 4	101 + 5	127 + 6	160 + 6	180 + 8	202 + 8	60 + 3	65 + 3	84 + 3
b_1	38 + 3	45 + 3	53 + 3	63 + 4	71 + 4	80 + 5	100 + 6	125 + 6	140 + 8	160 + 8	46 + 3	52 + 3	75 + 3
b_2	32 + 3	38 + 3	45 + 3	53 + 4	60 + 4	67 + 5	85 + 6	106 + 6	118 + 8	132 + 8	40 + 3	44 + 3	64 + 3
b_3	+	+	+	+	+	+	+	+	+	+	32 + 3	37 + 3	59 + 3
b_4	+	+	+	+	+	+	+	+	+	+	32 + 3	37 + 3	45 + 2
d_1	30 + 3	36 + 3	42 + 3	48 + 4	53 + 4	60 + 5	75 + 6	95 + 6	106 + 8	118 + 8	38 + 3	44 + 3	55 + 3
e_3	105 + 3	118 + 3	132 + 3	148 + 4	165 + 4	185 + 5	221 + 6	280 + 6	330 + 8	360 + 8	105 + 3	118 + 3	148 + 3
f_1	31 + 1	35 + 1	40 + 1	45 + 2	51 + 2	57 + 2	46 + 3	58 + 3	68 + 3	74 + 3	40 + 1	45 + 2	56 + 2
g_1	12.5 + 1	14 + 1	16 + 1	16 + 2	18 + 2	18 + 2	23 + 3	33 + 3	33 + 3	38 + 3	14 + 1	16 + 1	18 + 2
h_1	48 + 3	56 + 3	67 + 3	80 + 4	90 + 4	100 + 5	125 + 6	160 + 6	180 + 8	200 + 8	+	+	+
h_2	40 + 3	48 + 3	58 + 3	67 + 4	75 + 4	85 + 5	106 + 6	132 + 6	150 + 8	170 + 8	56 + 3	65 + 3	90 + 4
h_3	+	+	+	+	+	+	+	+	+	+	76 + 3	85 + 3	112 + 4
h_4	+	+	+	+	+	+	+	+	+	+	84 + 3	100 + 3	130 + 4
l_1	197 + 3	224 + 3	253 + 3	285 + 4	318 + 4	380 + 5	452 + 6	582 + 6	653 + 8	724 + 8	199 + 3	260 + 3	300 + 4
r_2	50 + 3	56 + 3	63 + 3	71 + 4	90 + 4	90 + 5	112 + 6	140 + 6	160 + 8	180 + 8	56 + 3	63 + 3	80 + 4
weight (forging) kg	3.2	4.5	6.3	8.8	12.3	17.1	34	66	95	136	5.1	8	15

Note: Safety latch on HBC forging decreases dimension a_2 about 5 mm and about 15 mm on RSN forging.

Note: The '+ number' after the nominal dimension indicates the tolerance. For example 160+6 means that the actual dimension is between 160 - 166 mm.

	Hook forging standard	
	RSN	**HBC**
Dimension standard	DIN 15401	DIN 15401 when applicable
Material standard	DIN 15400	DIN 15400

10 DRUM AND ROPE SHEAVE DIAMETERS



Rope sheave diameters	Rope diameter	Duty class	A	B	C	D
(nominal, mm)	(nominal, mm)	FEM / ISO	(mm)	(mm)	(mm)	(mm)
146	6.4	3m / ISO M6	22 / 22	3.3	18	40
180	8	3m / ISO M6	26 / 26	4.2	20	50
248	11	3m / ISO M6	32 / 38	5.8	23	65
288[1)]	11	4m / ISO M7	32 / 48	5.8	33	65
338	15	3m / ISO M6	40 / 46	8	28	85
398[1)]	15	4m / ISO M7	40 / 59	8	41	85

1) Standard as center wheels on some true-vertical lift hooks.

Frame size code	Rope diameter (mm)	Reeving	Rope drum diameter (nominal, (mm))	Rope drum pitch (mm)	Rope sheave diameter (nominal, mm)	Number of rope clamps on drum
Z	6.2	Standard	243	7	146	2
B	6.4	Standard	303	7.2	146	2
C	8	Standard	355	9.1	180	3
D	11	Standard	406	12.5	248	4
D	8	True vertical	406	9.1	180	2x3
E	15	Standard	608	17.1	338	6
E	11	True vertical	608	12.5	248 and 288	2x4
F	15	True vertical	608	17.1	338 and 398	2x6