



ELECTROPOWER
FOR TRADING AND IMPORTING

Horizontal Single-Stage Centrifugal Pumps EA Series



High-efficiency, end-suction, horizontal-shaft, centrifugal pumps compliant with DIN EN 733

Centrifugal pumps with long service life and ease of maintenance are used in

- HVAC systems
- Fire pump systems
- Irrigation
- Water supply
- Treatment
- Power plants

FLUIDPROPERTY

- Clean, non-hard, non-viscose, chemically neutral water that is free of solid abrasive particles
- The maximum glycol ratio that can be added to the circulation water is 30%.

TECHNICAL SPECIFICATIONS

Max. Flow Rate	: 1400 m ³ /h
Max. Head	: 100 mSS
Motor Speed	: 2900 rpm (50 Hz), 1450 rpm (50 Hz)
Connection	: DN 32 - DN 250
Power	: 0.25 kW - 160 kW
Maximum Operating Pressure	: 16 bar
Maximum Ambient Temperature	: 40°C
Temperature of Pumped Liquid	: -10°C ÷ +120°C
Protection Class	: IP44
Insulation Class	: Class F

Design Properties

Pump Body	: GG25 - Cast Iron
Shaft	: AISI 316 - Stainless Steel
Impeller	: GG25 - Cast Iron (optionally bronze)
Adapter	: GG25 - Cast Iron
Mechanical Seal	: Carbon / Silicone / Carbide

CONSTRUCTION SPECIFICATIONS

EA

- End-suction, cast iron pump with radial outlet.
- Hydraulic sizes and nominal diameters of inlet and outlet ports conform with (DN) EN 733 DIN 24255.
- Flanges conform with EN 1092-2 DIN 2532.

MOTOR - PUMP COUPLING

- Two different types of motor/pump couplings are available:

EAR- RIGID COUPLING

- Shaft extension (rigid coupling) attached to the standard motor shaft with a wedge, bracket, adapter and pump.

EAS-FLEXIBLE COUPLING

- Pump and electric motor supported with a bracket leg and a connection set on a chassis with a star coupler.

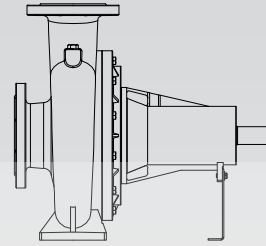
OPTIONAL ACCESSORIES

- Stainless steel 316 or galvanized steel counter-flanges.
- Pressure gauge attachable intermediate flange.

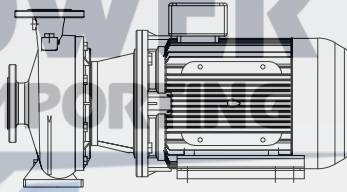
OPTIONAL FEATURES

- Different voltages and frequencies
- Special materials for the mechanical seal and gasket
- Models with air relief valves
- Frequency converter system
- Flexible sleeve for EAS series - coupling connection system
(Enables easy maintenance of mechanical seal, impeller and other parts without dismantling the suction and discharge pipes of the pump body)
- Bronze impeller

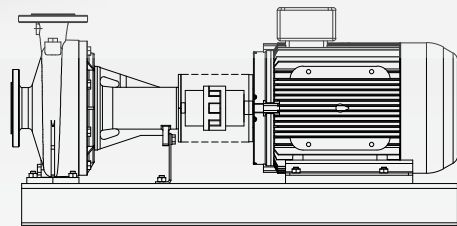
EA



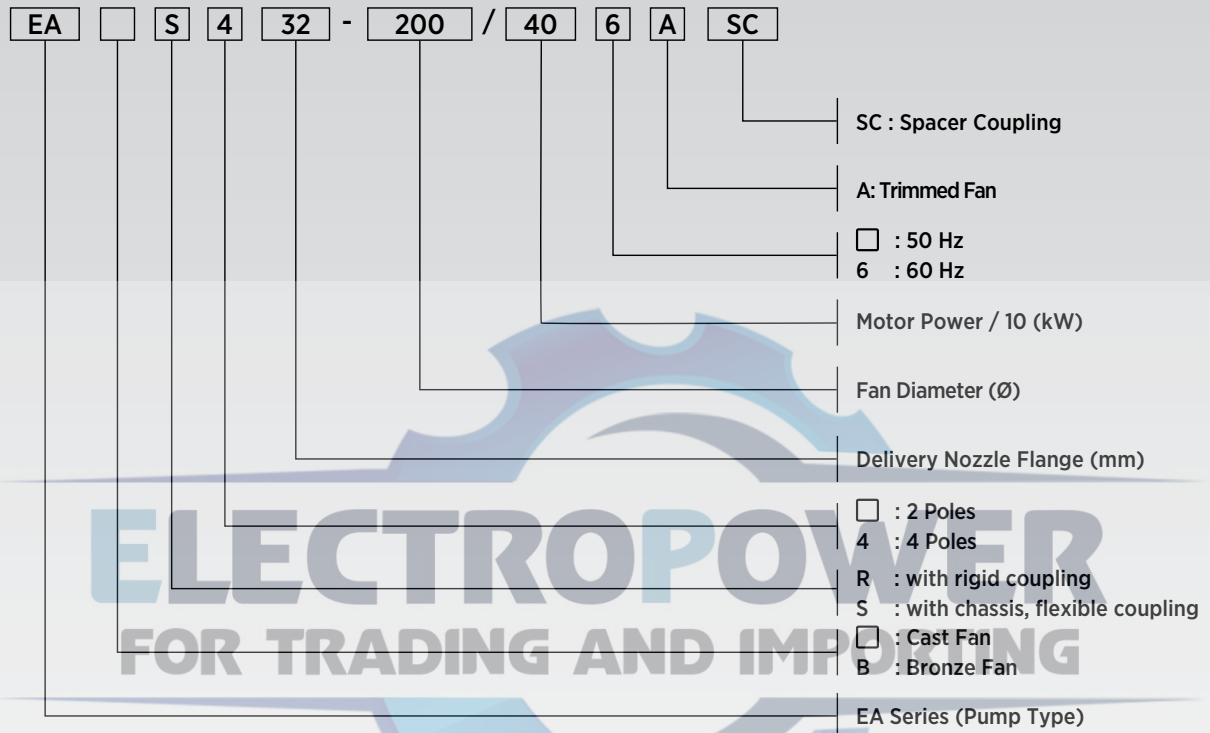
EAR



EAS



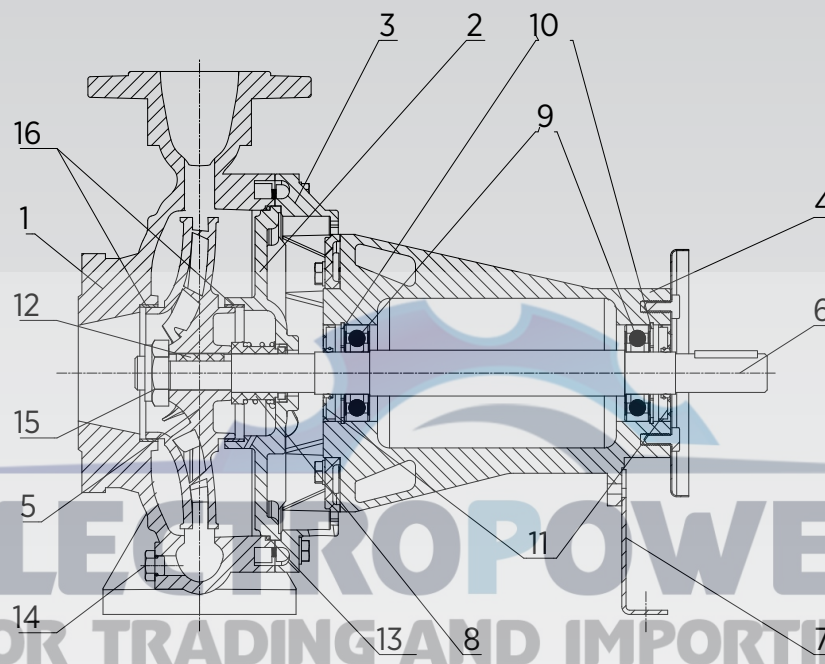
EA SERIES PUMP IDENTIFICATION CODE



PUMP LABEL

ETNA®		CE	ALP Pompa Teknolojileri A.Ş. Dudullu OSB 2. Cad. No: 14 34775 Ümraniye - İSTANBUL 0216 561 47 74	
TYPE:				
CAPACITY (Q):		m ³ /h	H: mSS	
SPEED:		rpm	POWER: kW	
SERIAL NO:		YEAR of MANUFACTURE:		

EA SERIES PUMPS



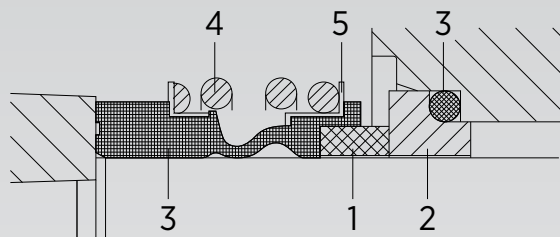
REF. N.	PART NAME	MATERIAL	STANDARDS	
			EUROPE	USA
1	Pump Body	Cast Iron	EN 1561 - GJL 250 (JL1040)	ASTM Class 35
2	Seal Body	Cast Iron	EN 1561 - GJL 250 (JL1040)	ASTM Class 35
3	Pump Flange	Cast Iron	EN 1561 - GJL 200 (JL1030)	ASTM Class 25
4	Bearing Body	Cast Iron	EN 1561 - GJL 200 (JL1030)	ASTM Class 25
5	Impeller (Cast Iron)	Cast Iron	EN 1561 - GJL 200 (JL1030)	ASTM Class 25
	Impeller (Bronze)	Bronze	CuSn7ZnPb - Rg-7 (DIN 1705)	UNS C90700
6	Shaft	Steel	EN 10088-X17CrNi16-2 (1.4057)	AISI 431
7	Pump Foot	Steel	EN 10025:2:2006-S235JR	A283C
8	Mechanical Seal	Ceramic / Carbon / NBR (Standard)		
9	Bearing	Steel	DIN 625 , 6300 Series	
10	Snap Ring	Spring Steel C60-C65	DIN 472	
11	Oil Seal	NBR (Standard)		
12	Wedge	Stainless Steel	EN 10088-1 X2CrNiMo17-12-2 (1.44044)	
13	O-ring	EPDM (Standard)		
14	Fill and Drain	Nickel Coated Brass (Standard)		
15	Shaft End	Stainless Steel	EN 10088-1 X2CrNiMo17-12-2 (1.44044)	
16	Wear Ring	Bronze	CuSn7ZnPb - Rg-7 (DIN 1705)	AISI 316L

MECHANICAL SEAL

Mechanical seal connection dimensions in accordance with EN 12756 and ISO 3069

List of Materials

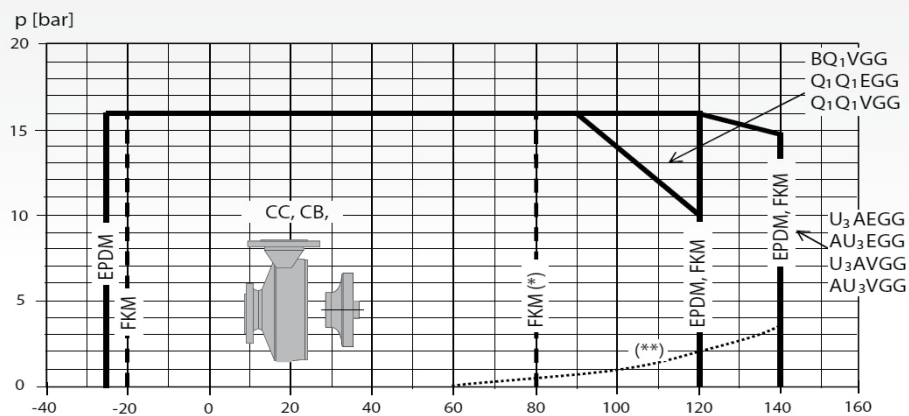
Positions 1-2	Position 3	Positions 4-5
B: Resin-Impregnated Carbon	E: EPDM	G: AISI 304
V: Ceramic	V: FKM (FPM)	
Q1: Silicon Carbide	P: NBR	
U3 : Tungsten Carbide		
A: Antimony-Impregnated Carbon		



Seal Type

Type	Position					Temperature (°C)
	1	2	3	4	5	
	Rotating Part	Stationary Part	Elastics	Springs	Other Parts	
Standard Mechanical Seal						
B V E G G	B	V	E	G	G	-30/+120
Other Mechanical Seal Types						
V B V G G	V	B	V	G	G	-10/+120
Q ₁ B V G G	Q ₁	B	V	G	G	-10/+120
Q ₁ Q ₁ V G G	Q ₁	Q ₁	V	G	G	-10/+120
V B E G G	V	B	E	G	G	-30/+120
Q ₁ B E G G	Q ₁	B	E	G	G	-30/+120
Q ₁ Q ₁ E G G	Q ₁	Q ₁	E	G	G	-30/+120
A U ₃ E G G	A	U ₃	E	G	G	-25/+140

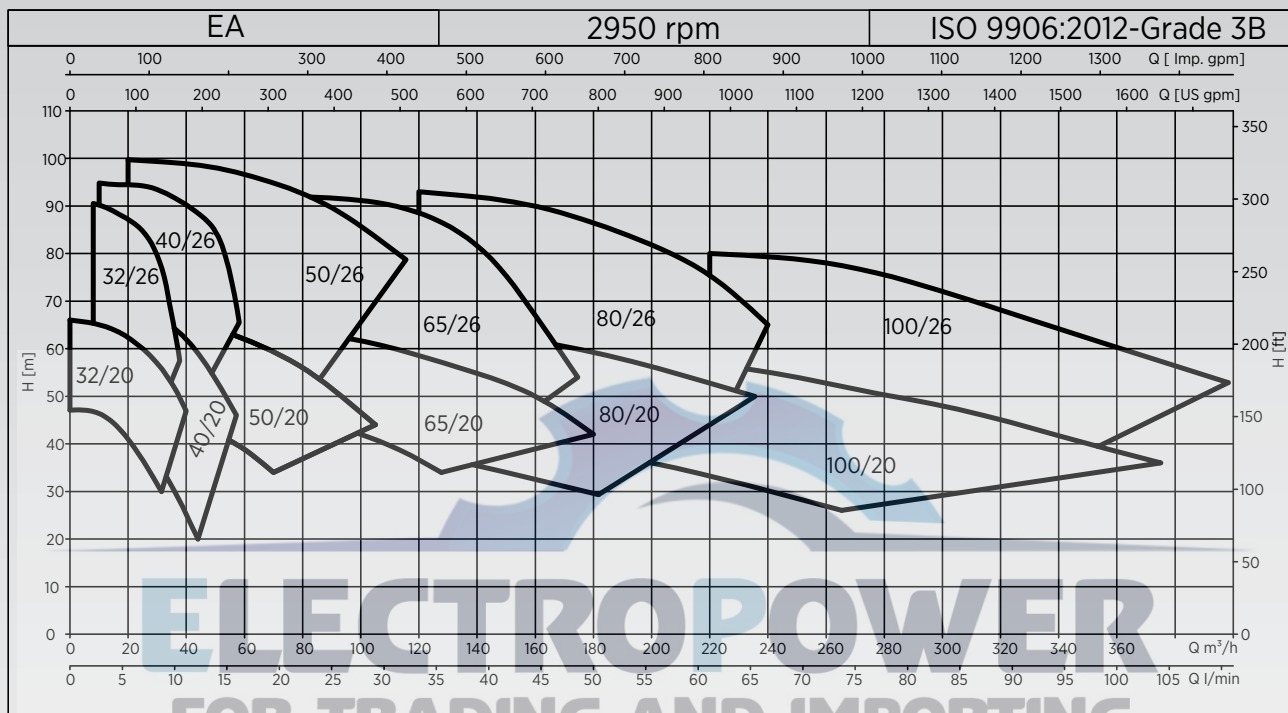
Pressure / Temperature Limits (for any type of seal)



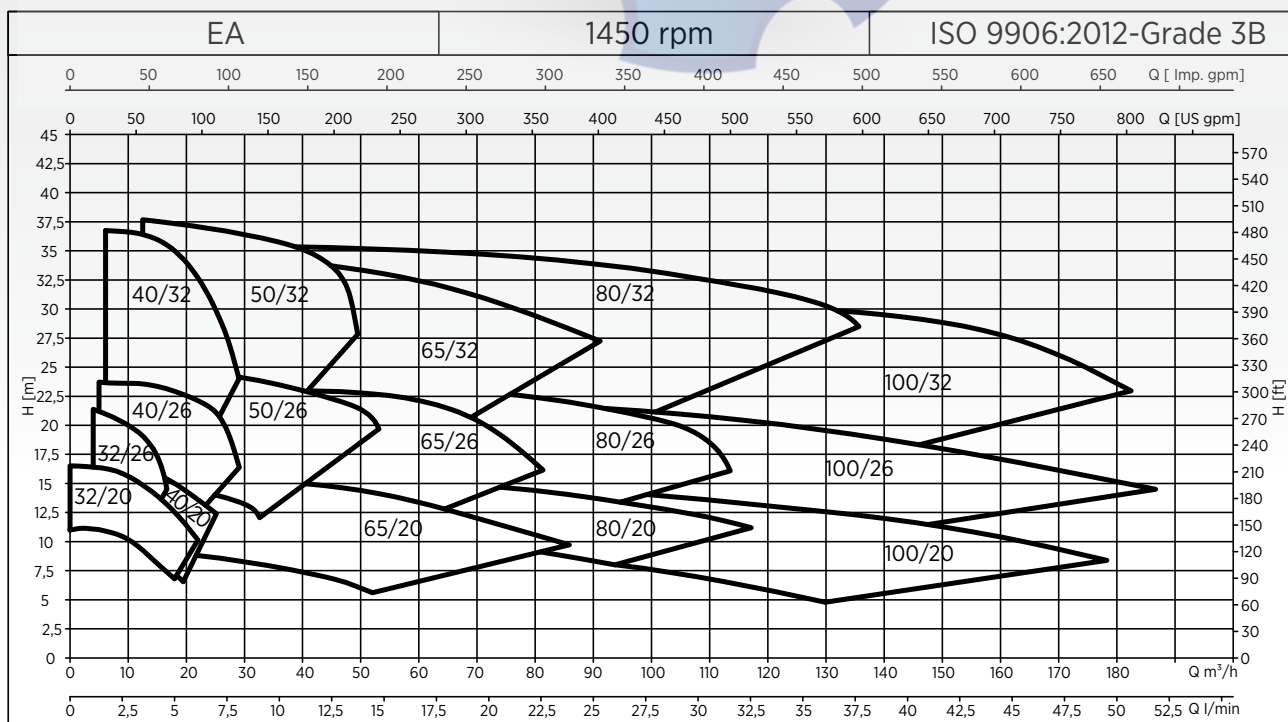
CC: Cast Iron Body, Cast Iron Fan

CB: Cast Iron Body, Bronze Fan

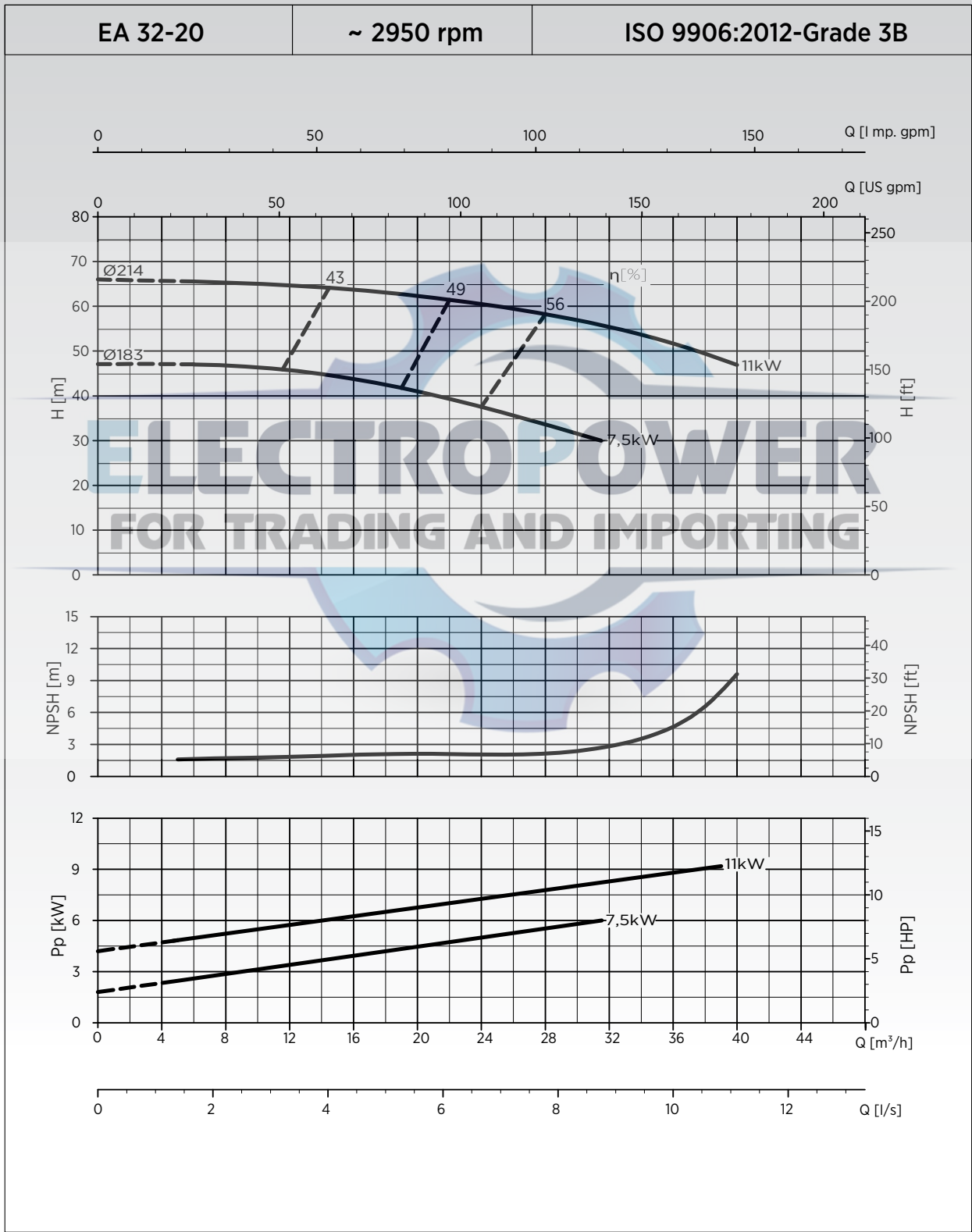
PERFORMANCE CURVES 50Hz, 2 POLES



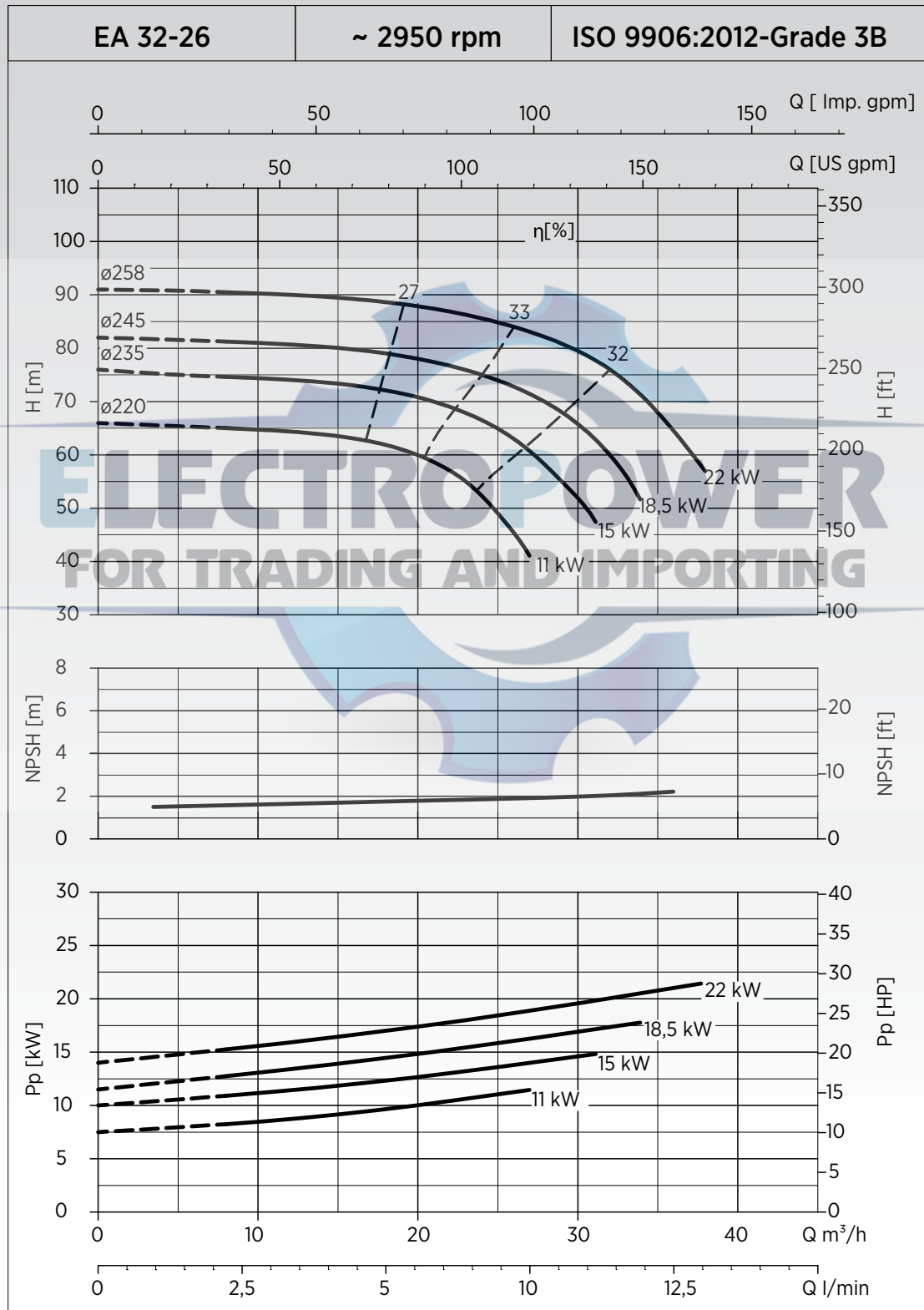
PERFORMANCE CURVES 50Hz, 4 POLES



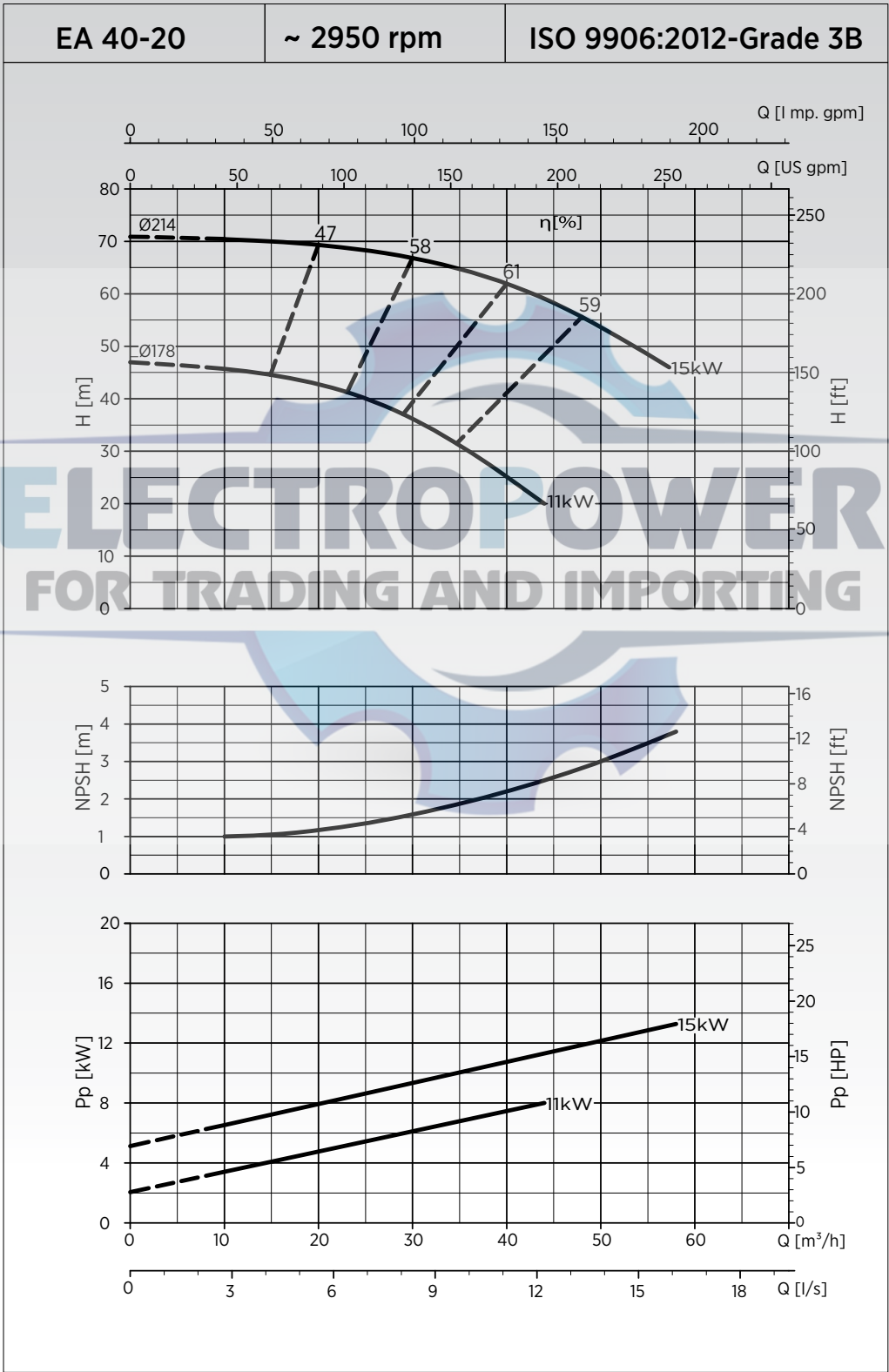
HYDRAULIC PERFORMANCE CURVES



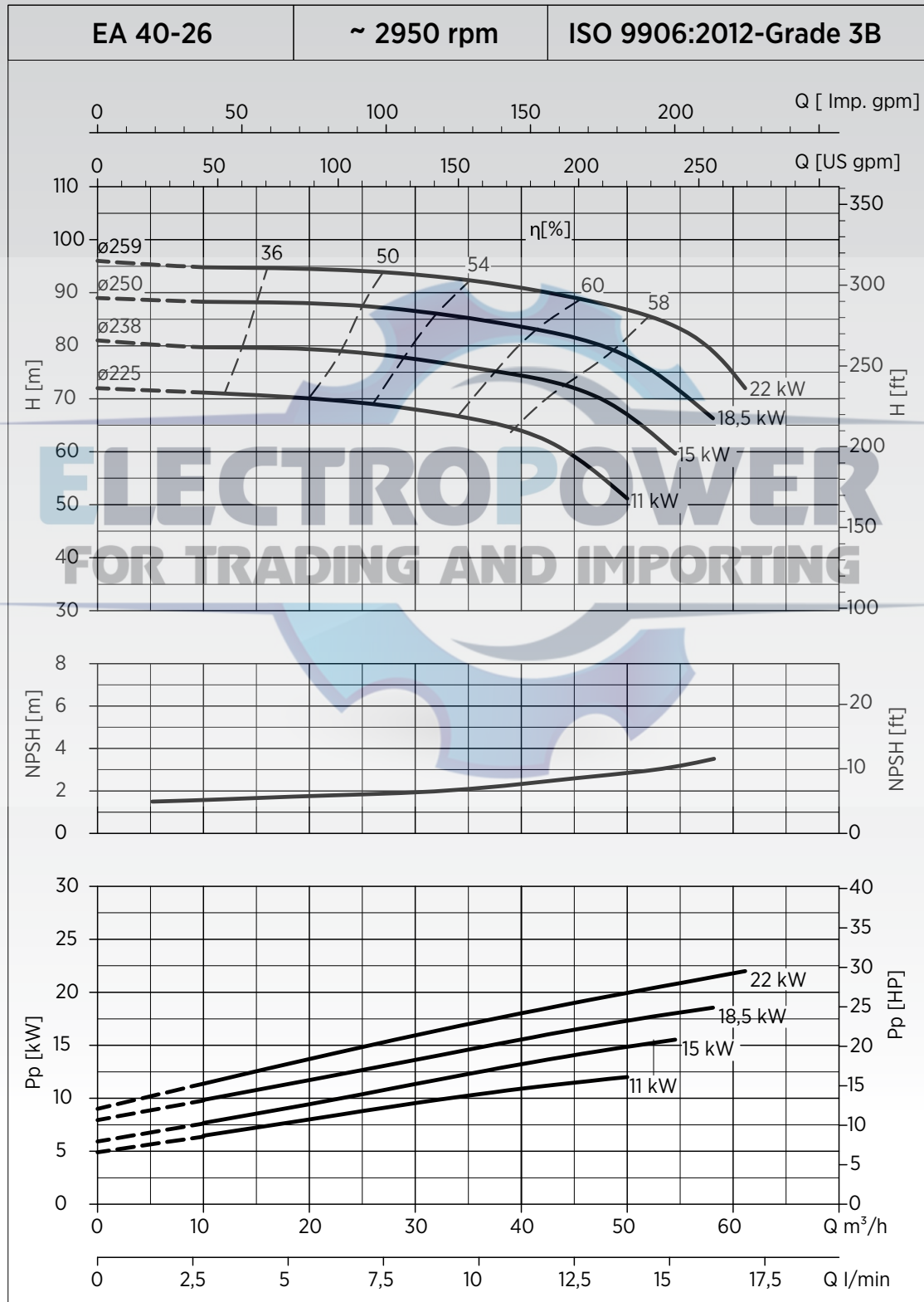
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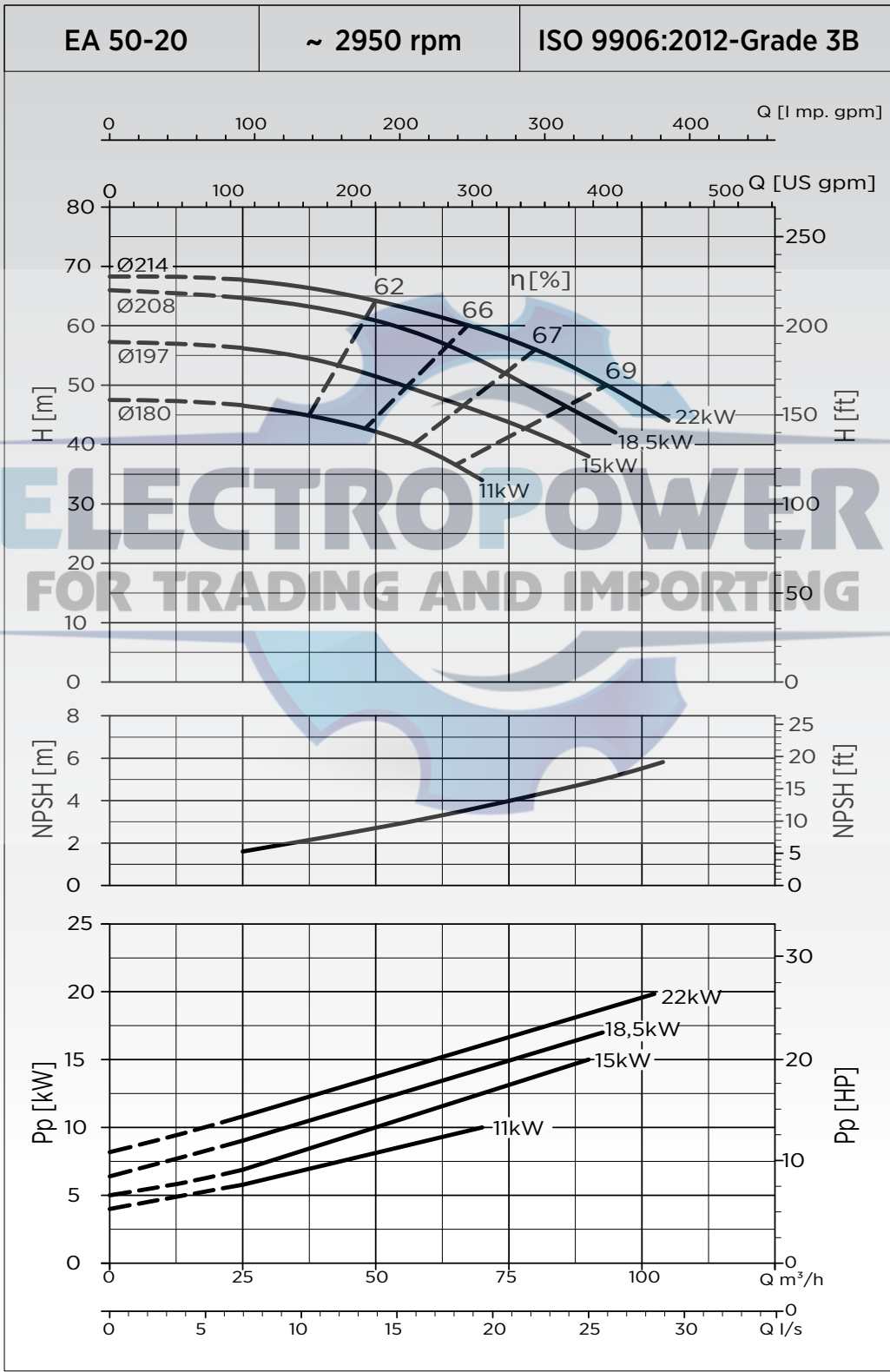
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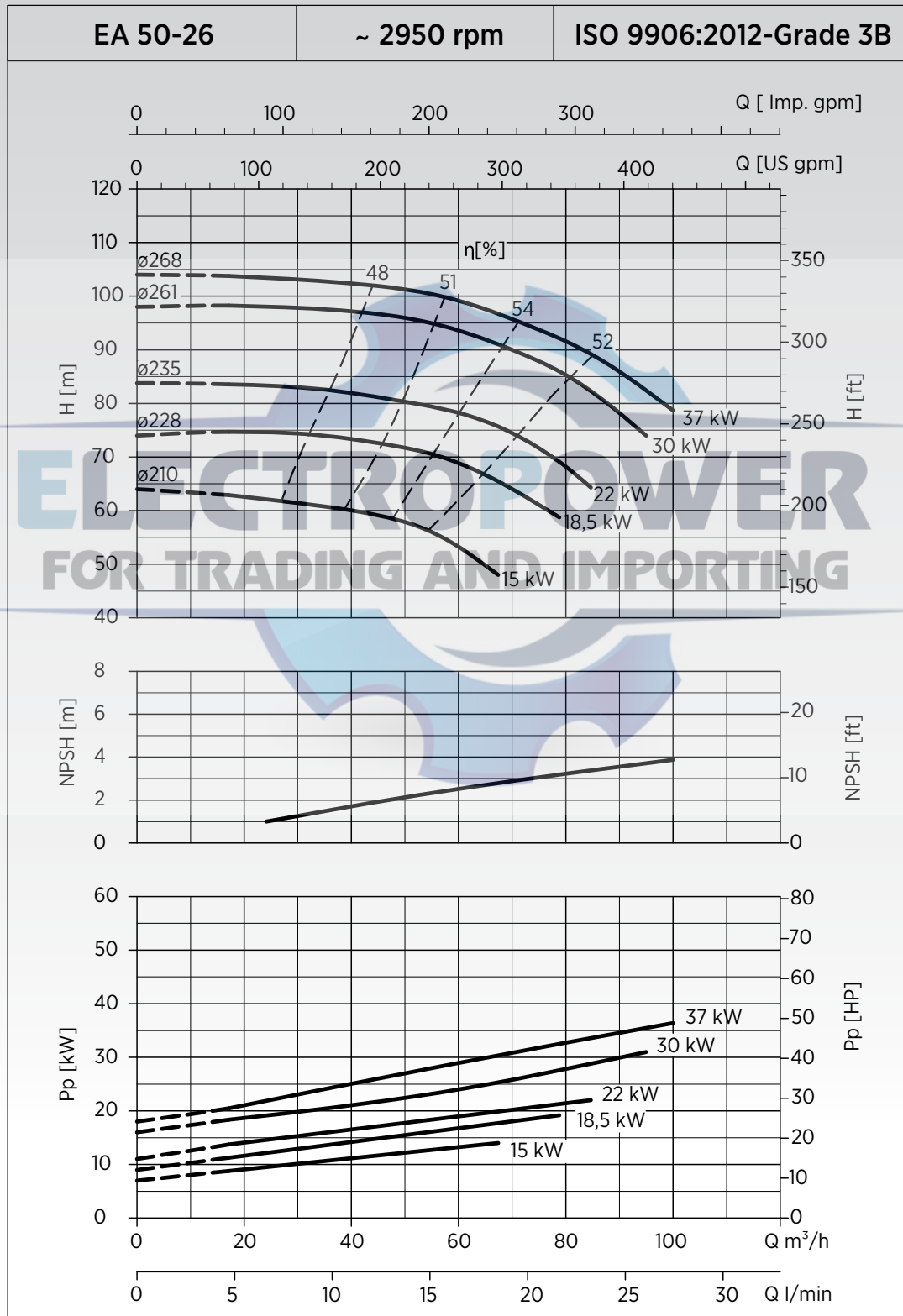
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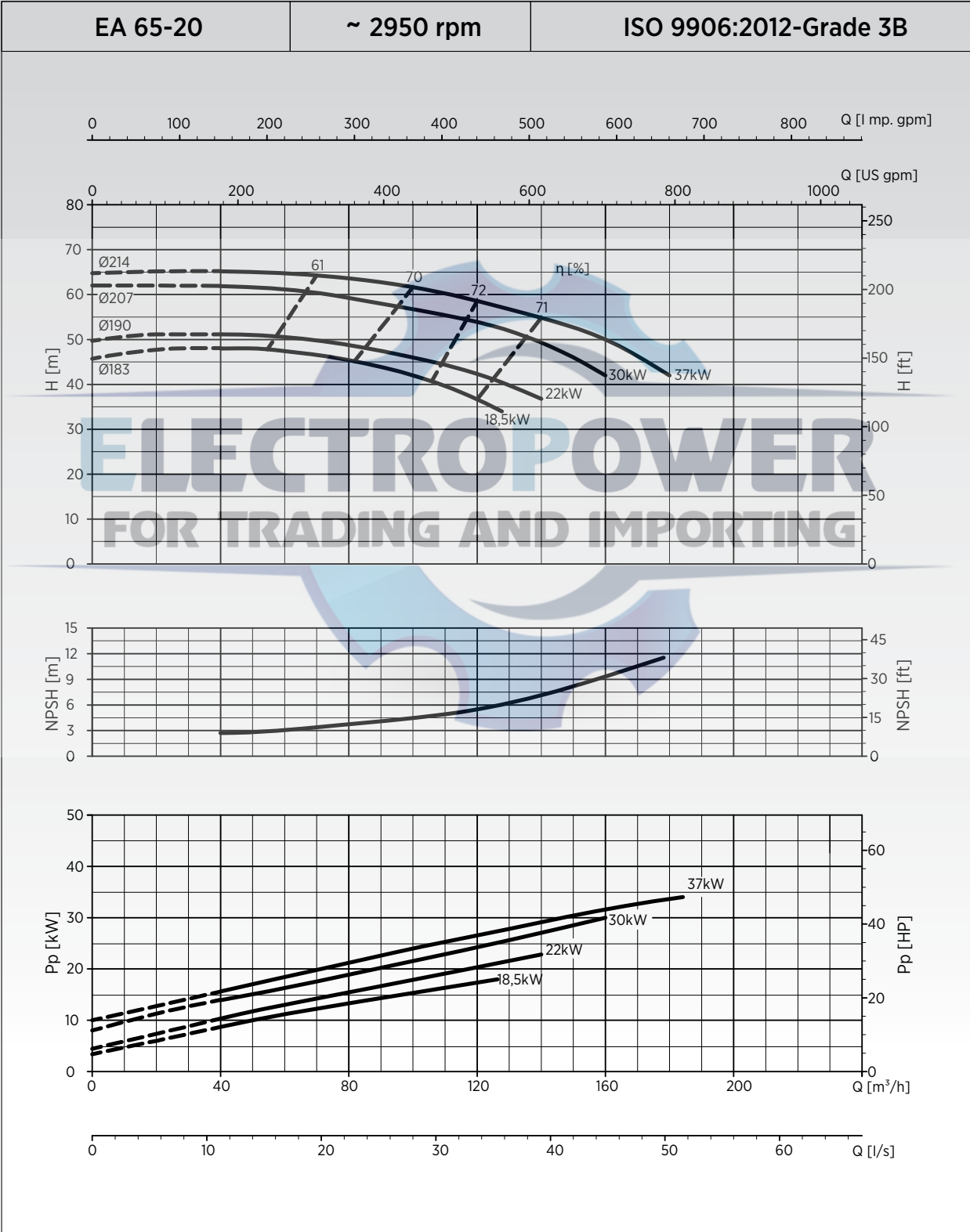
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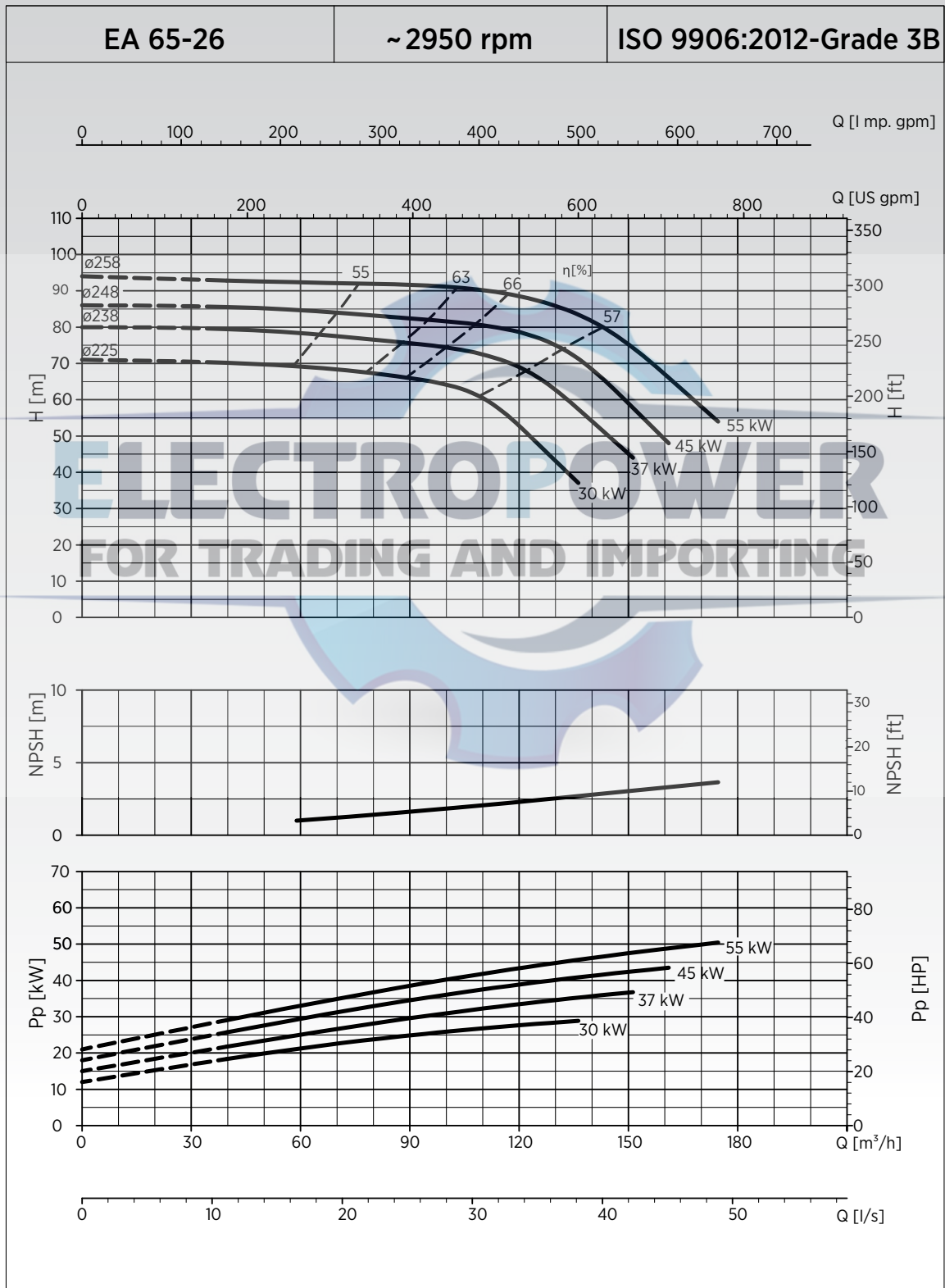
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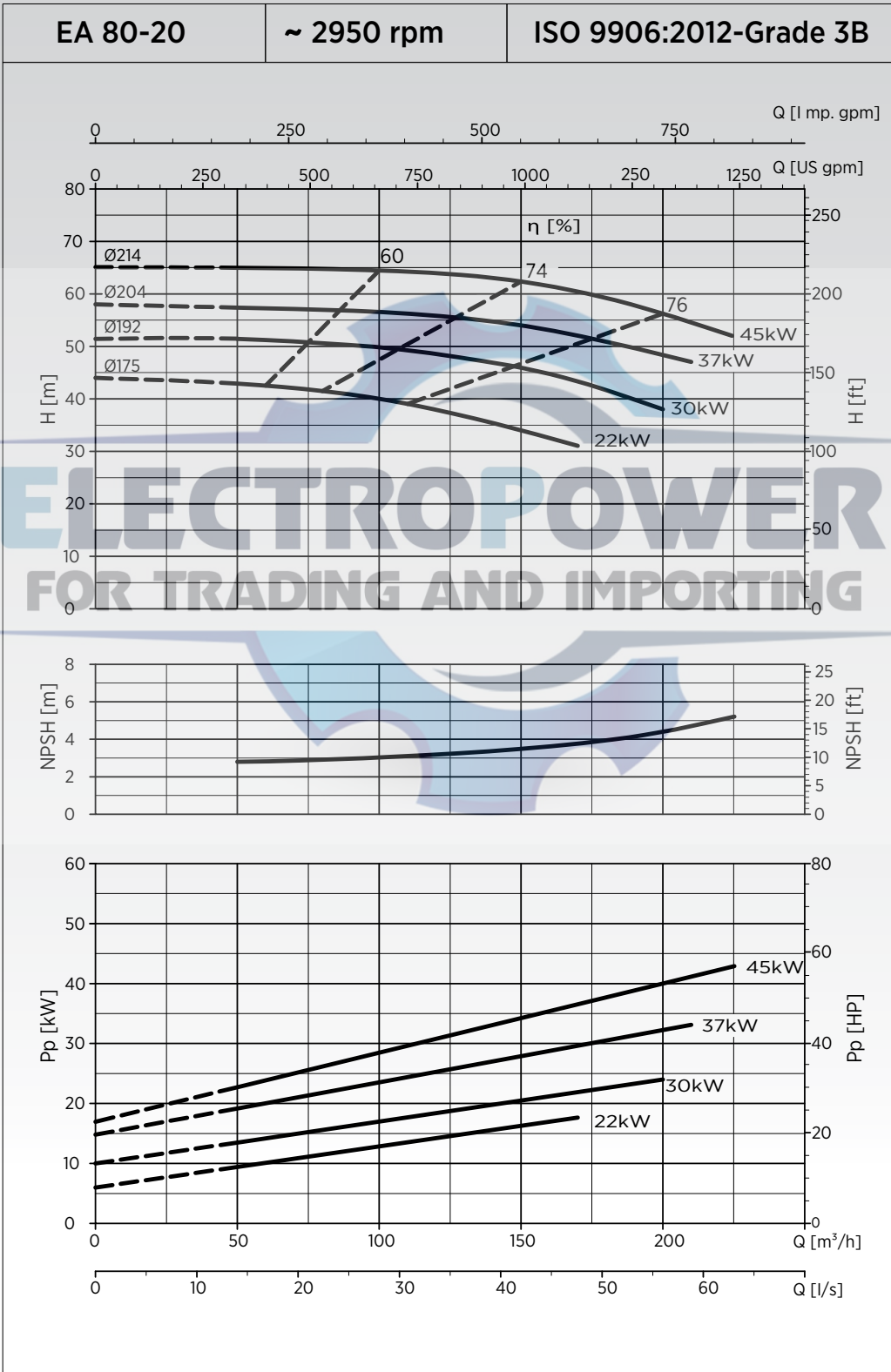
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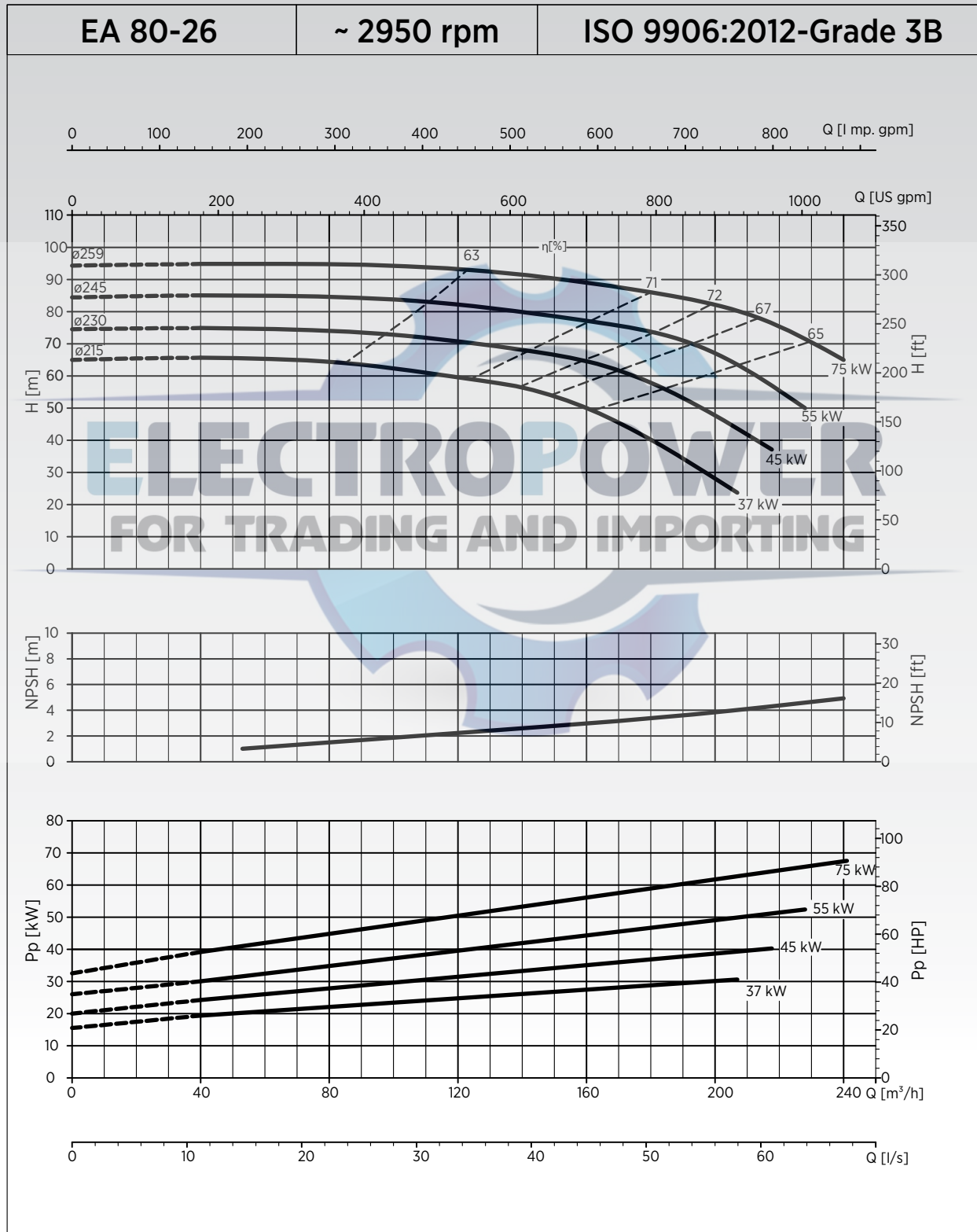
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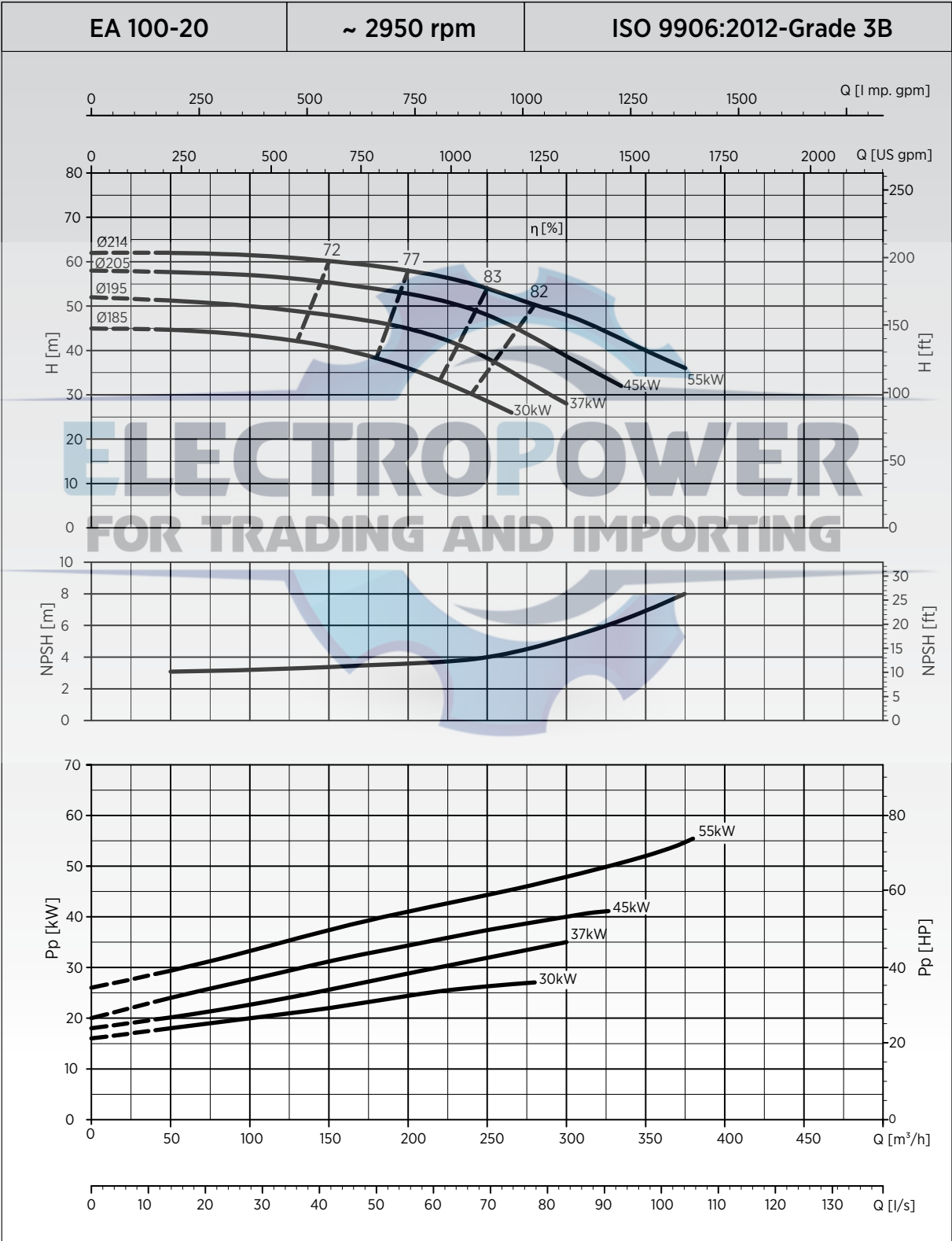
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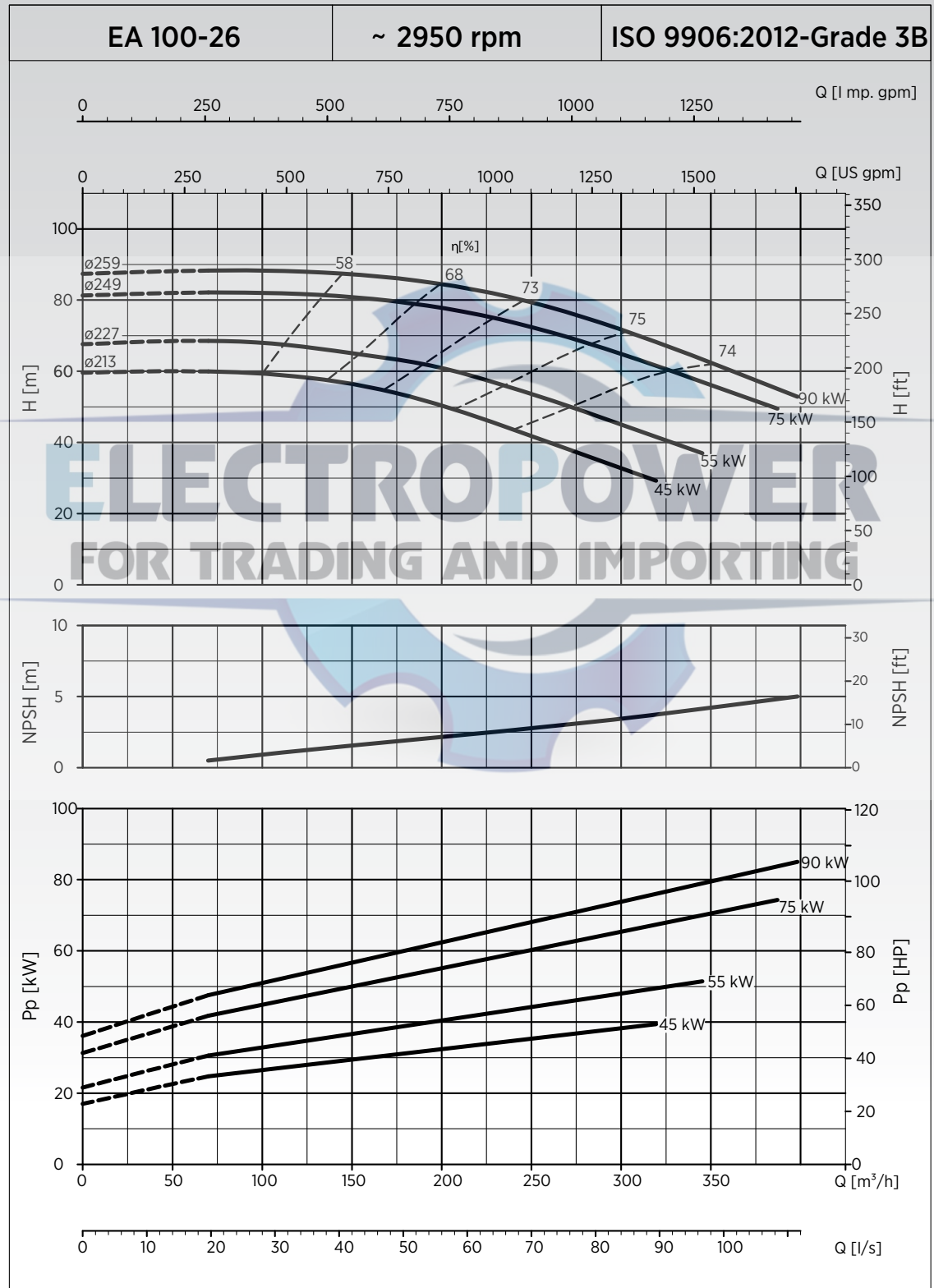
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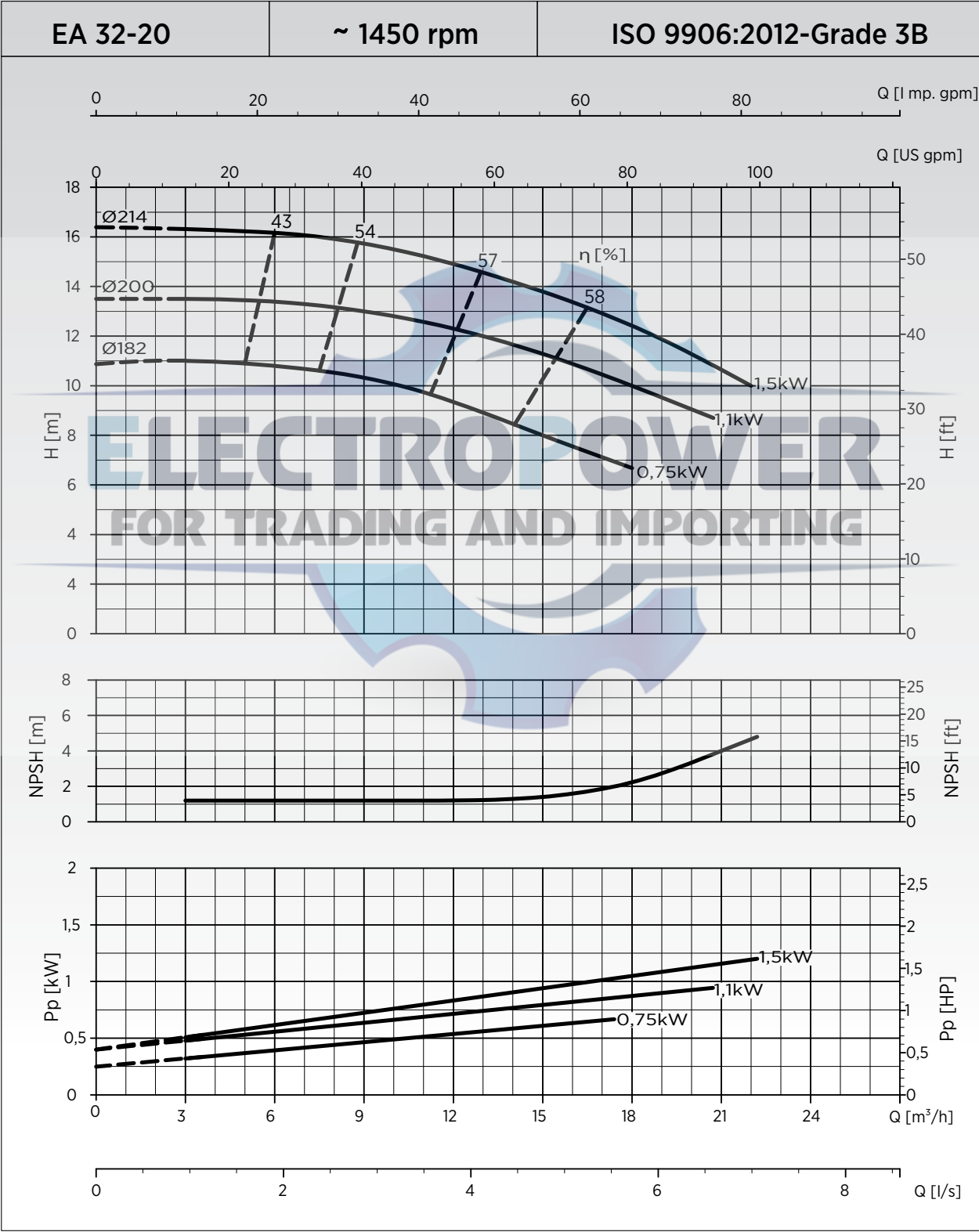
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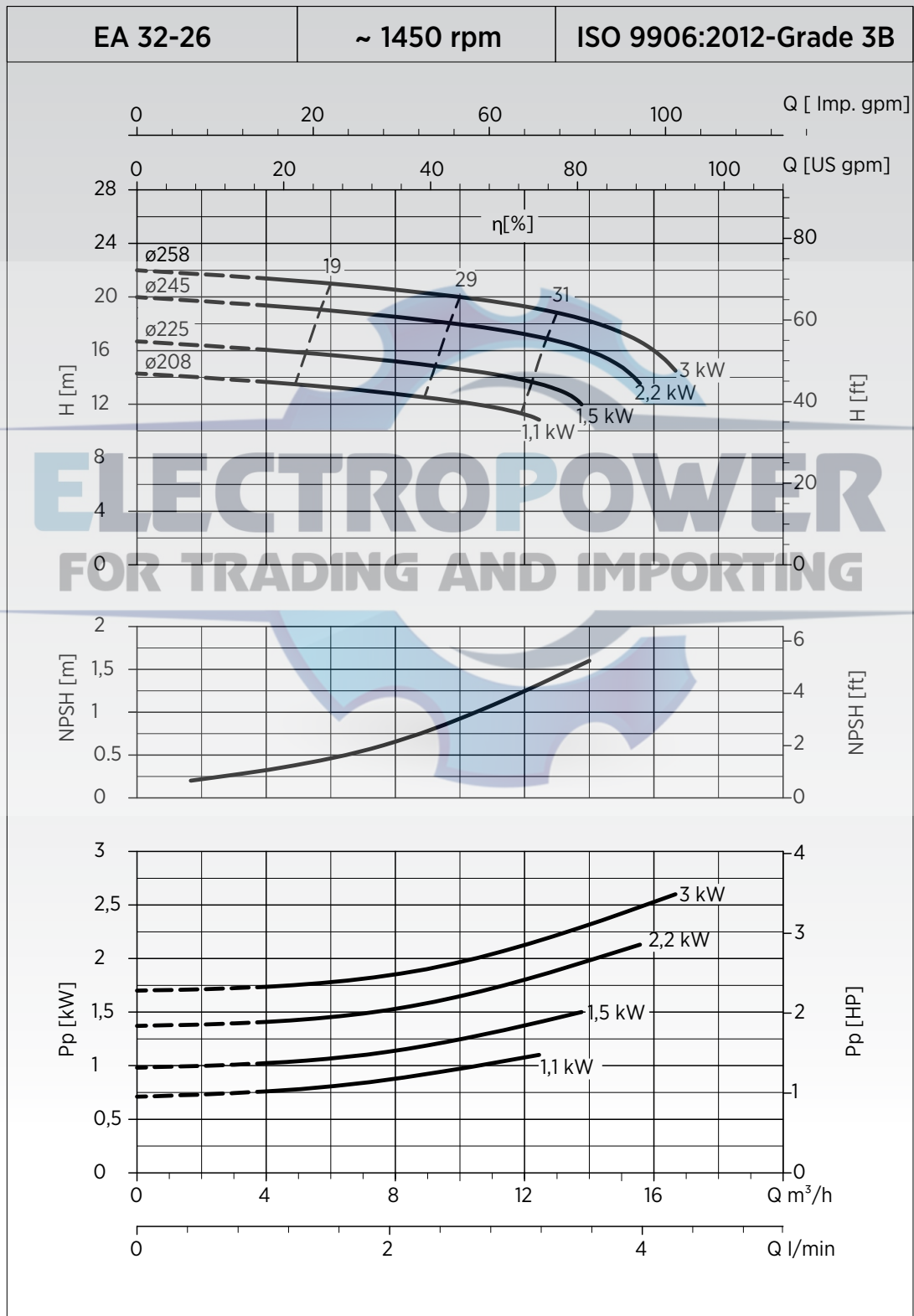
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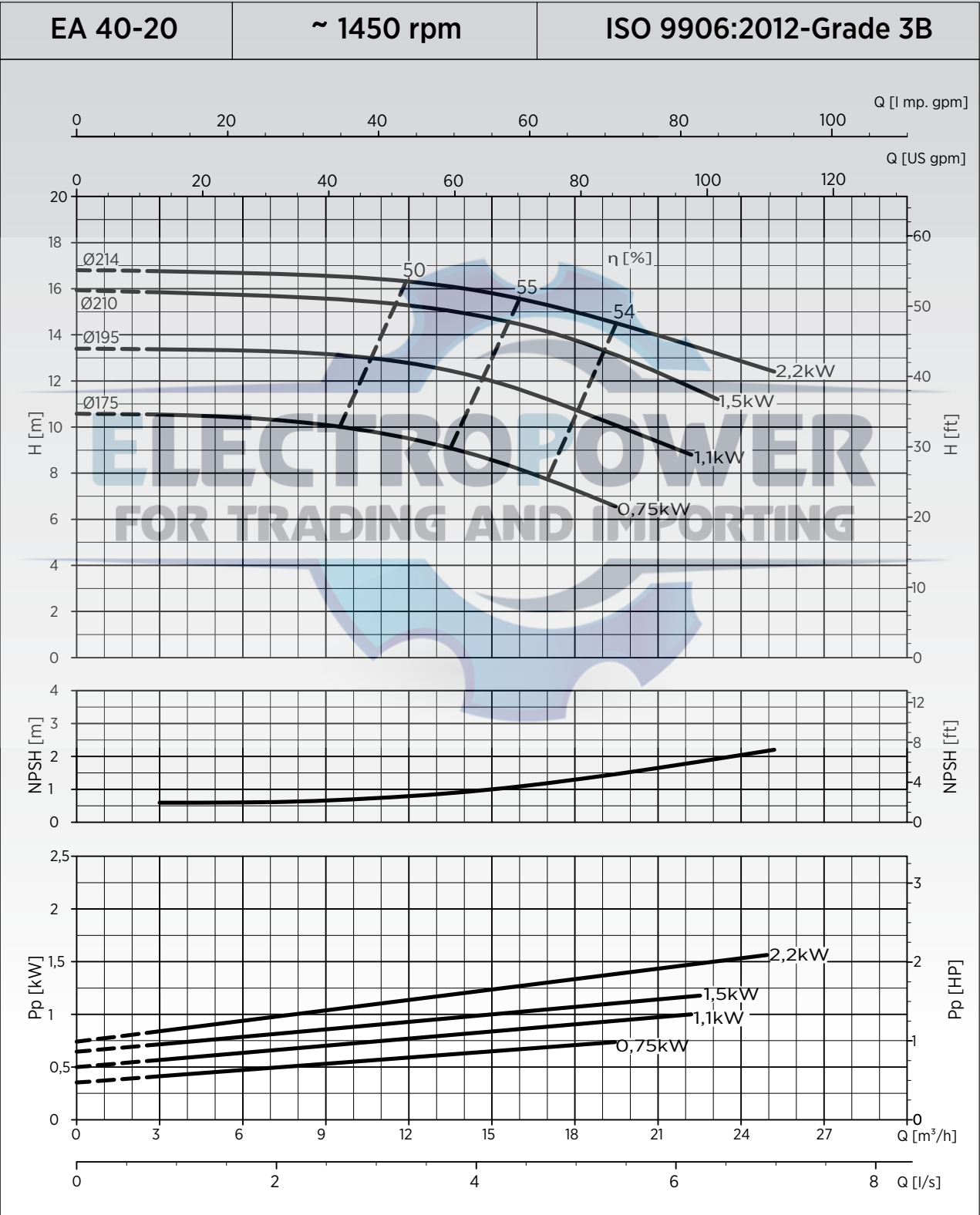
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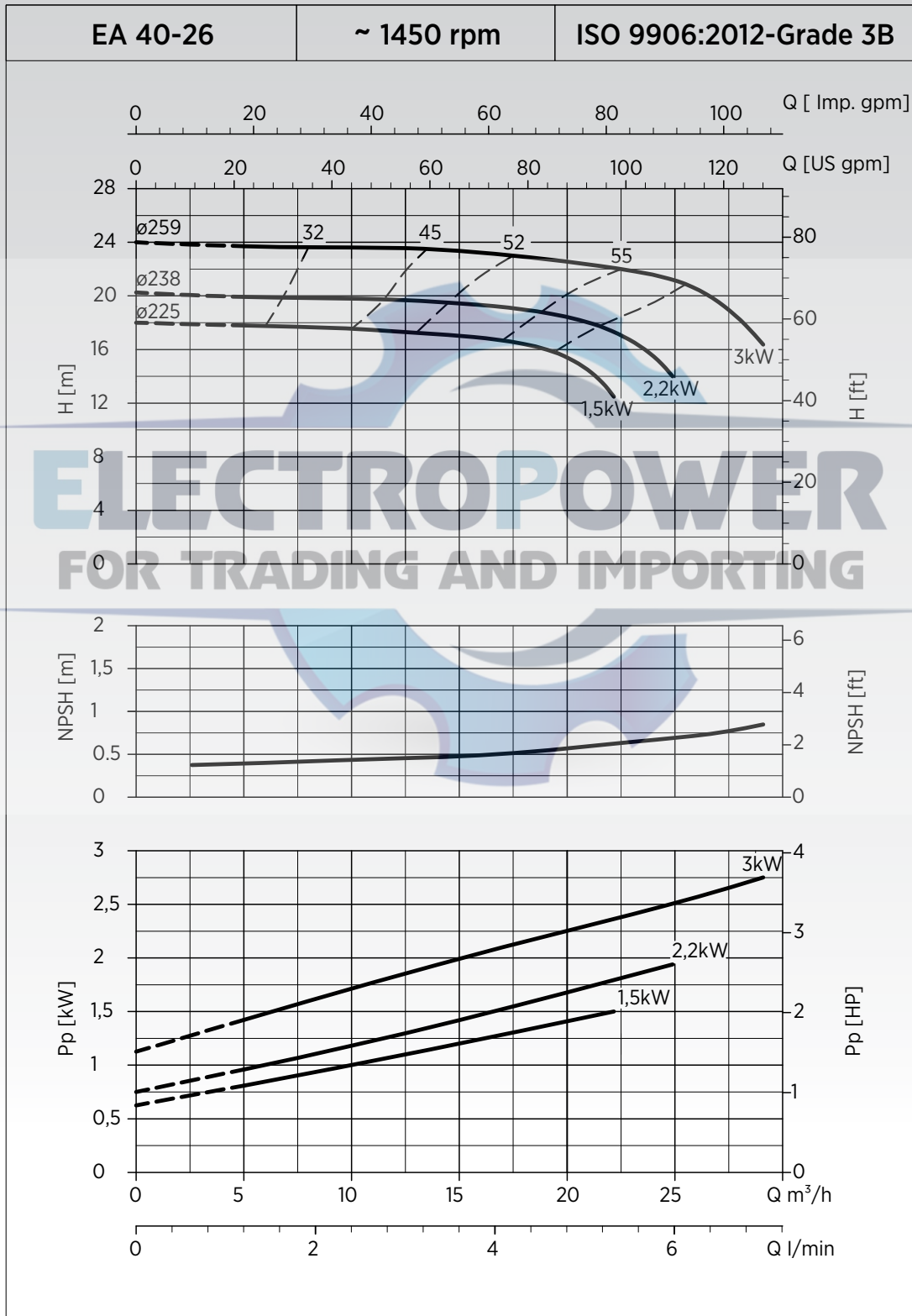
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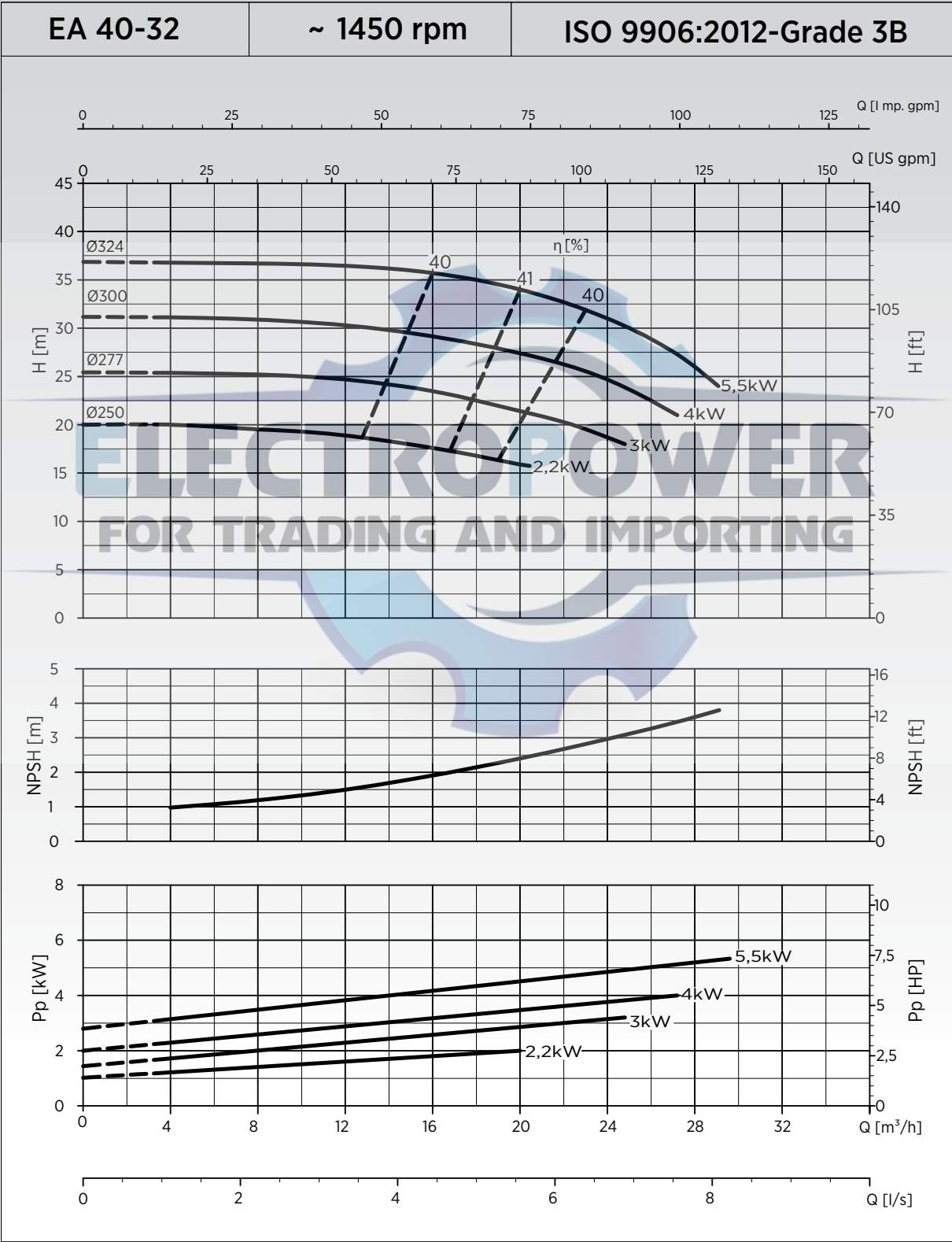
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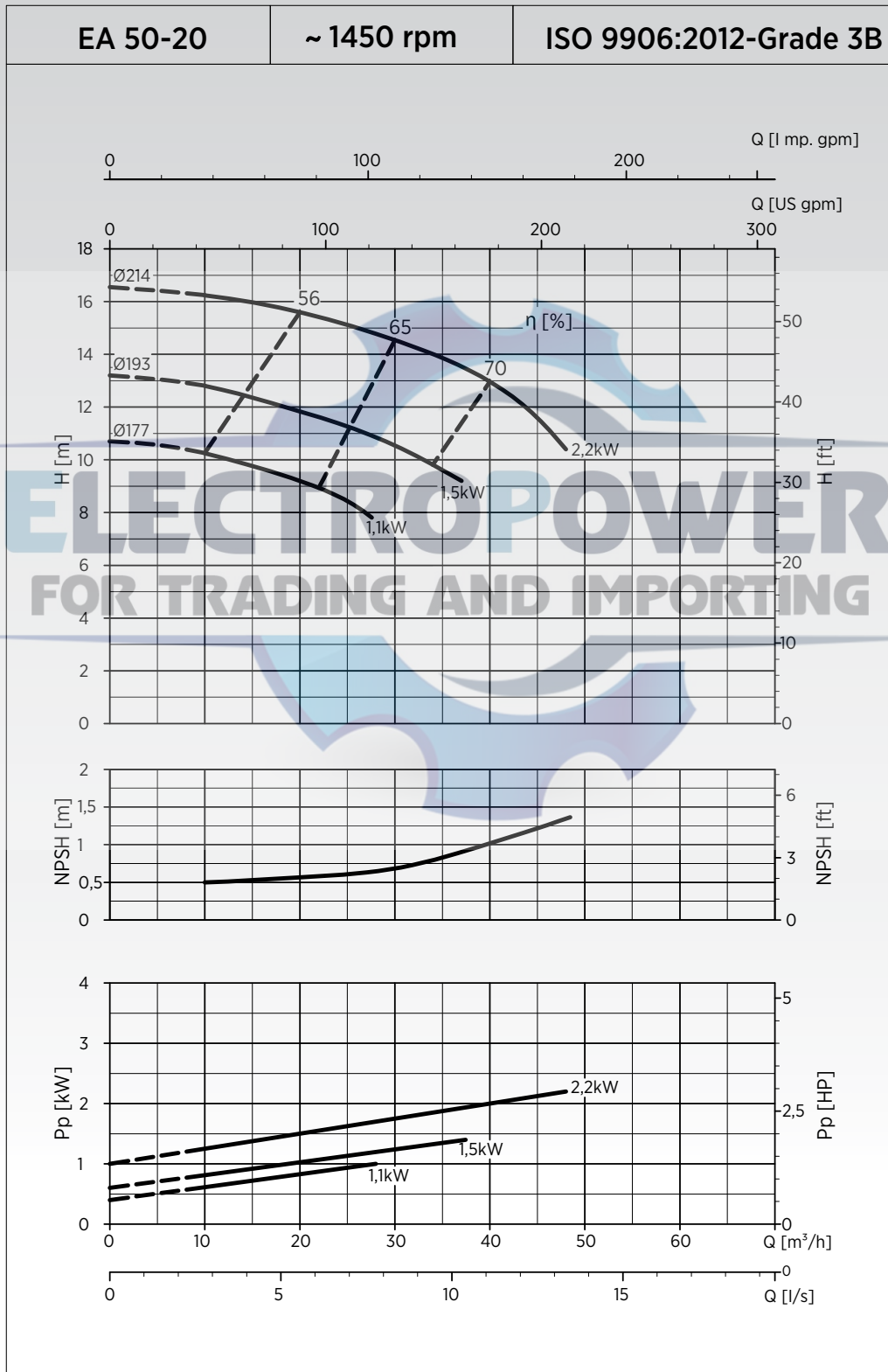
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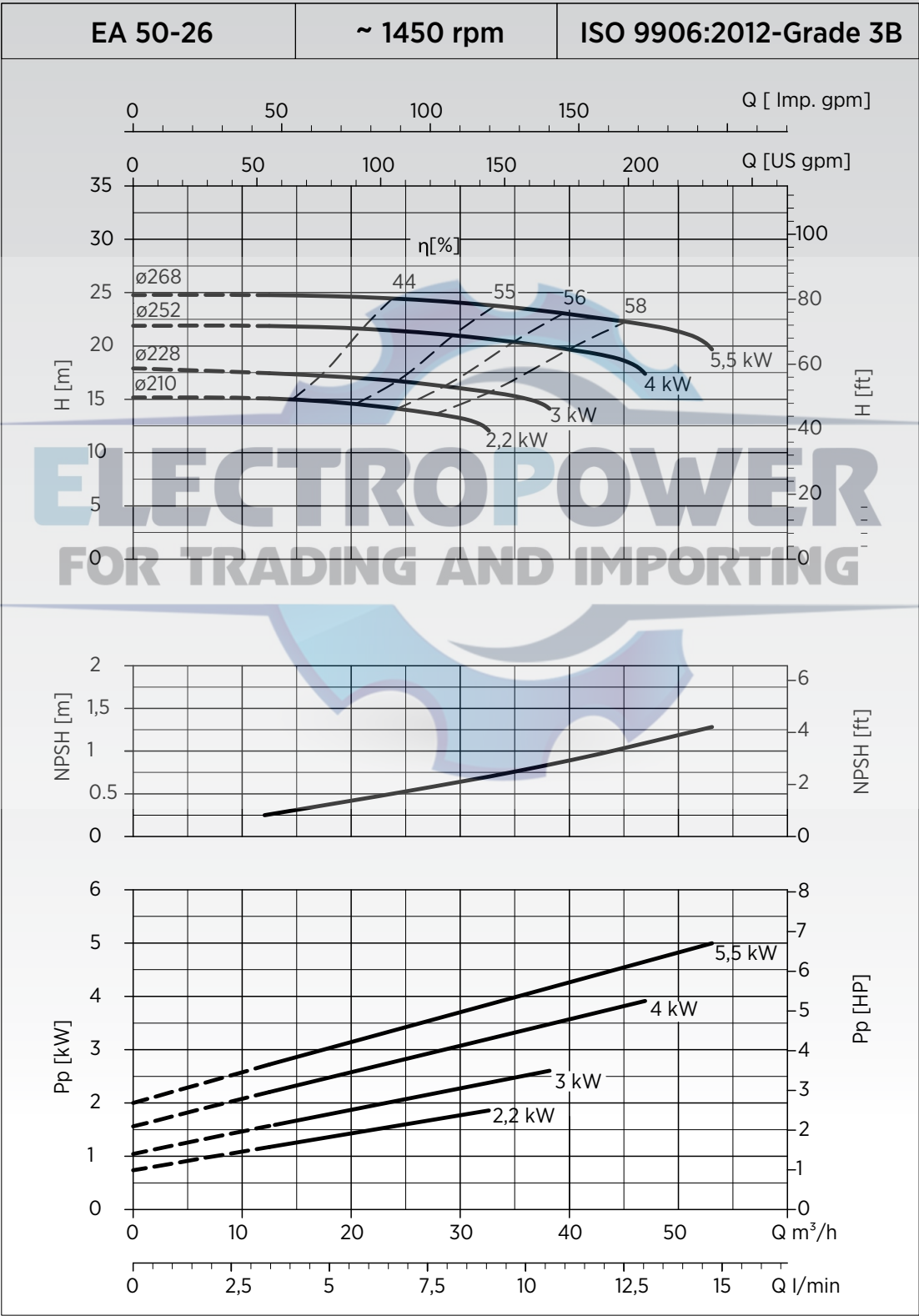
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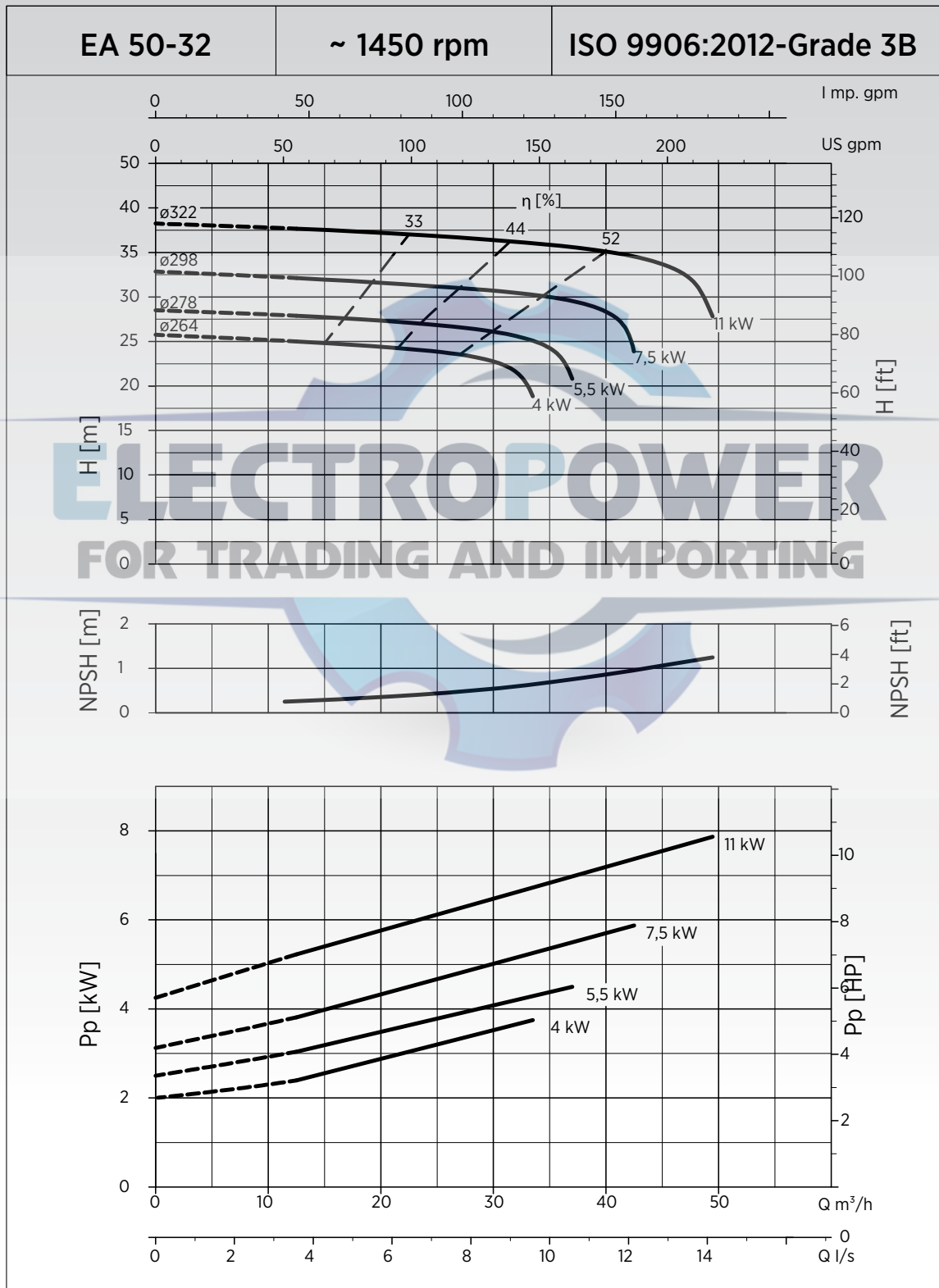
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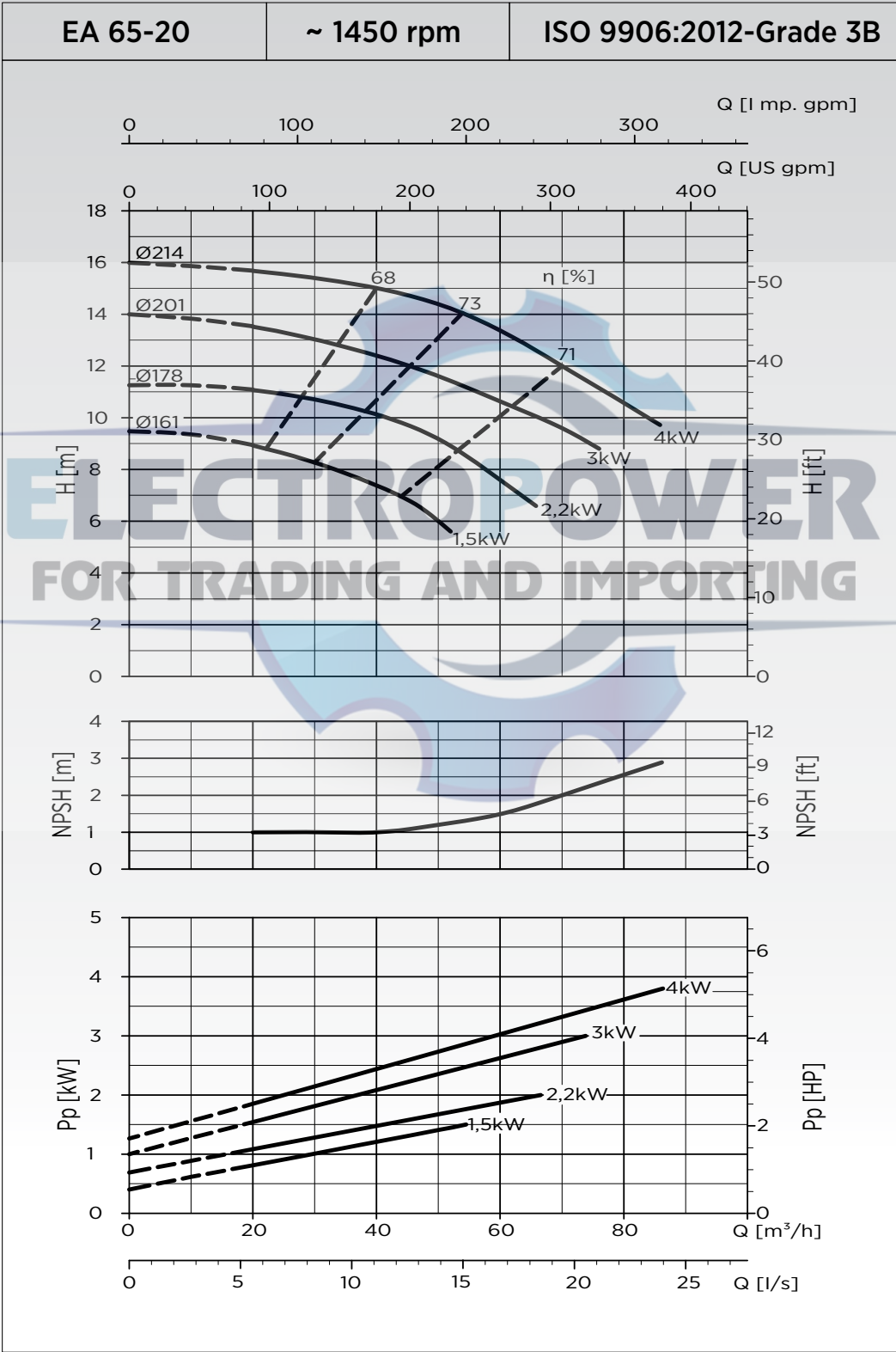
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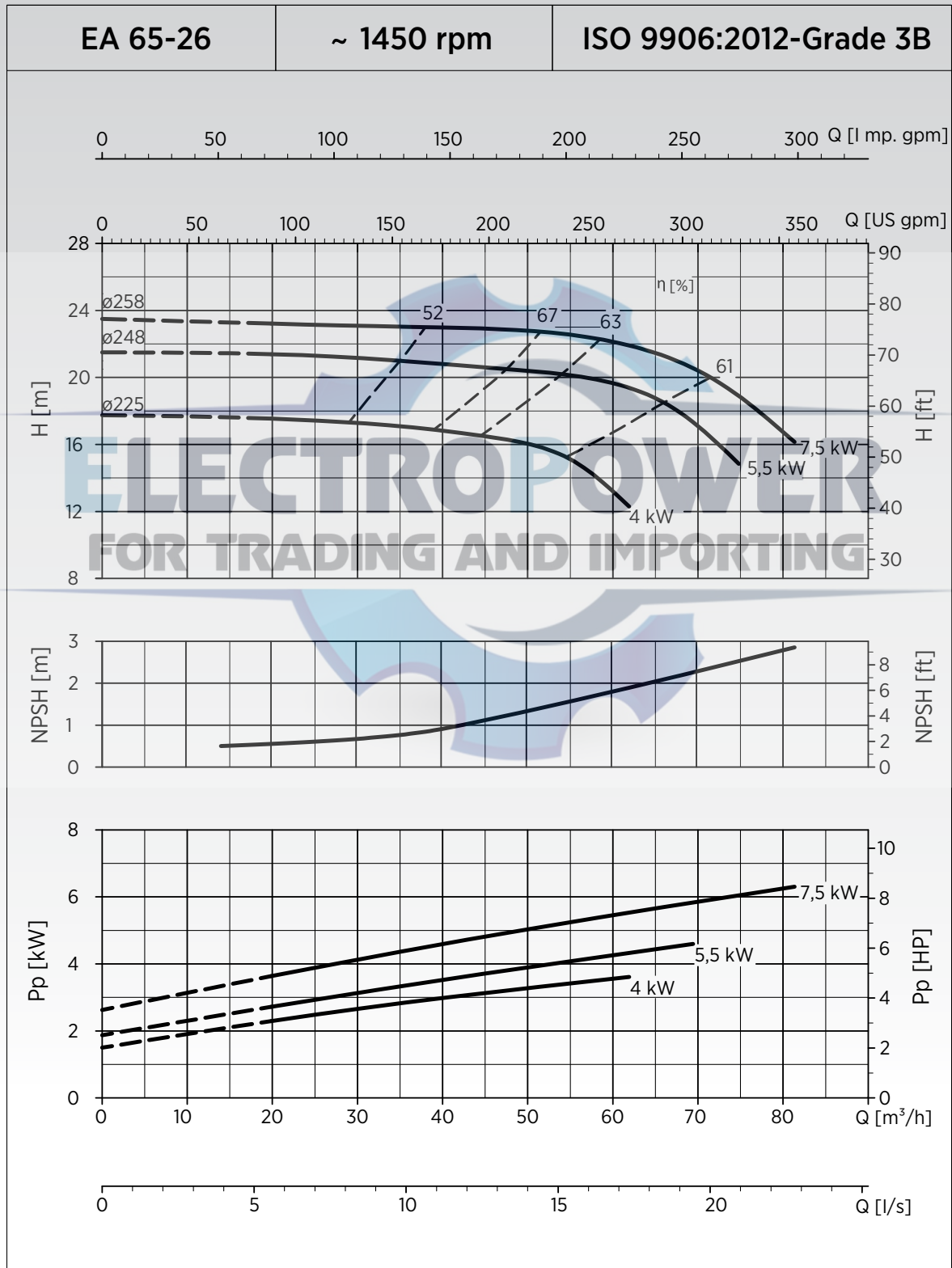
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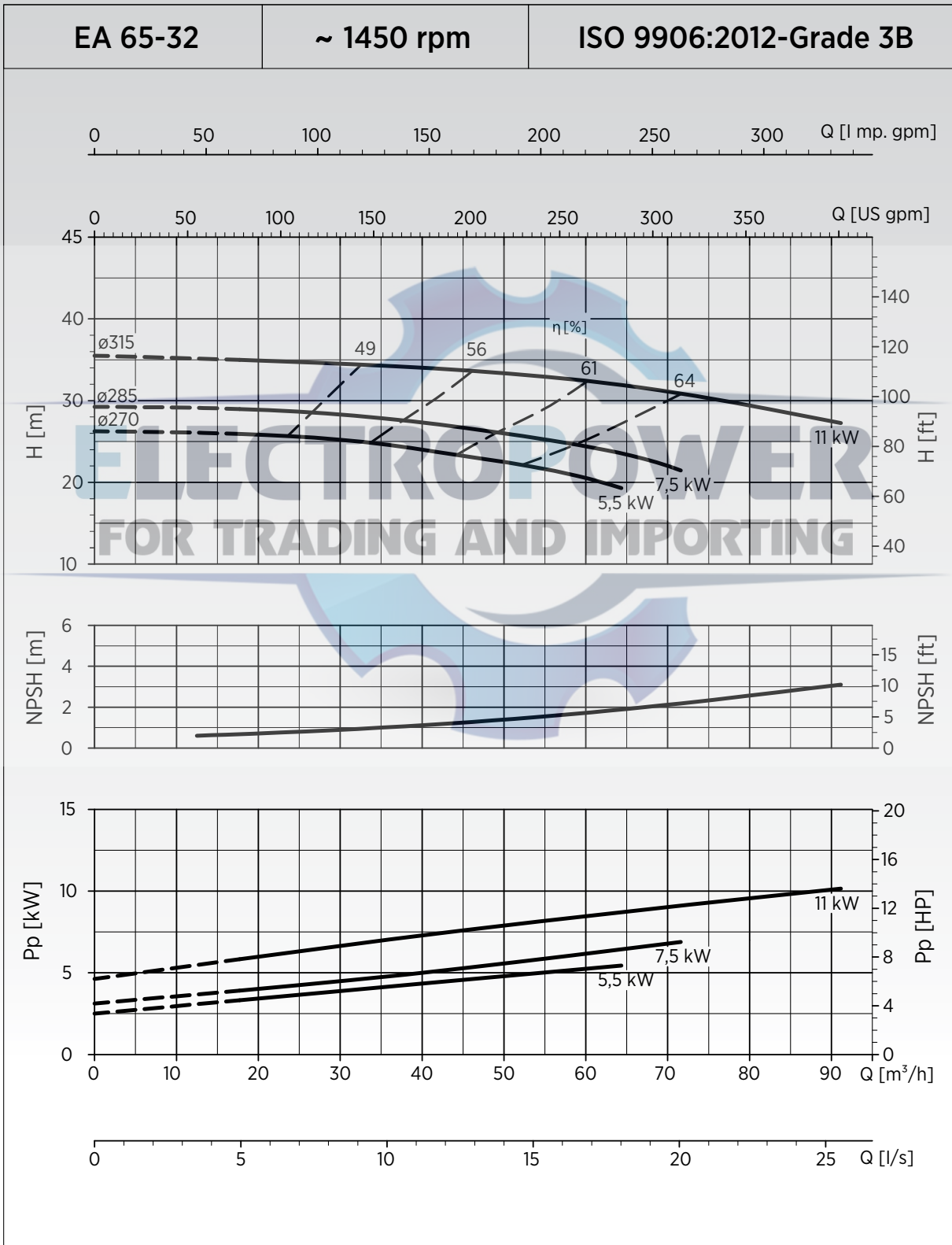
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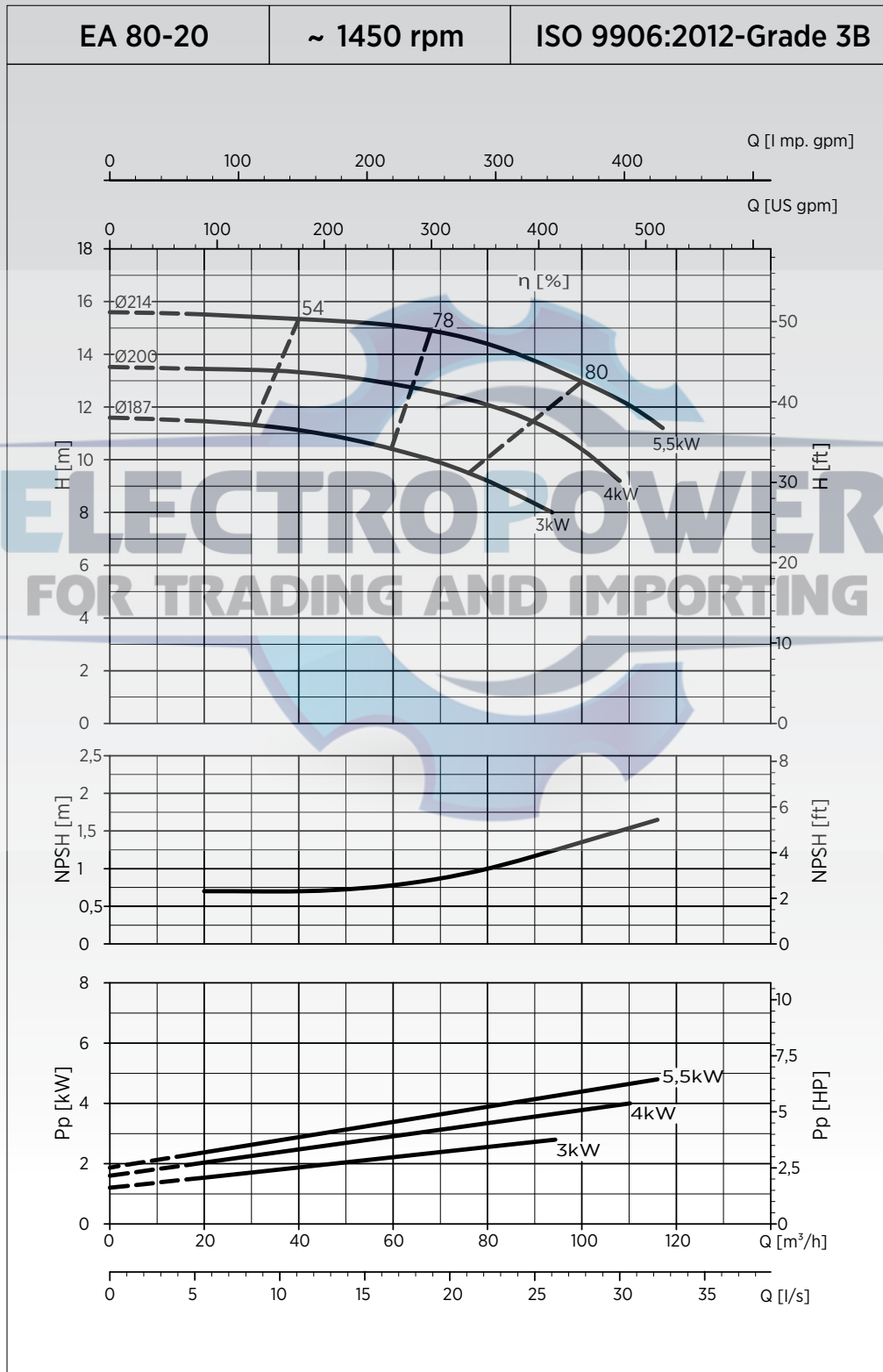
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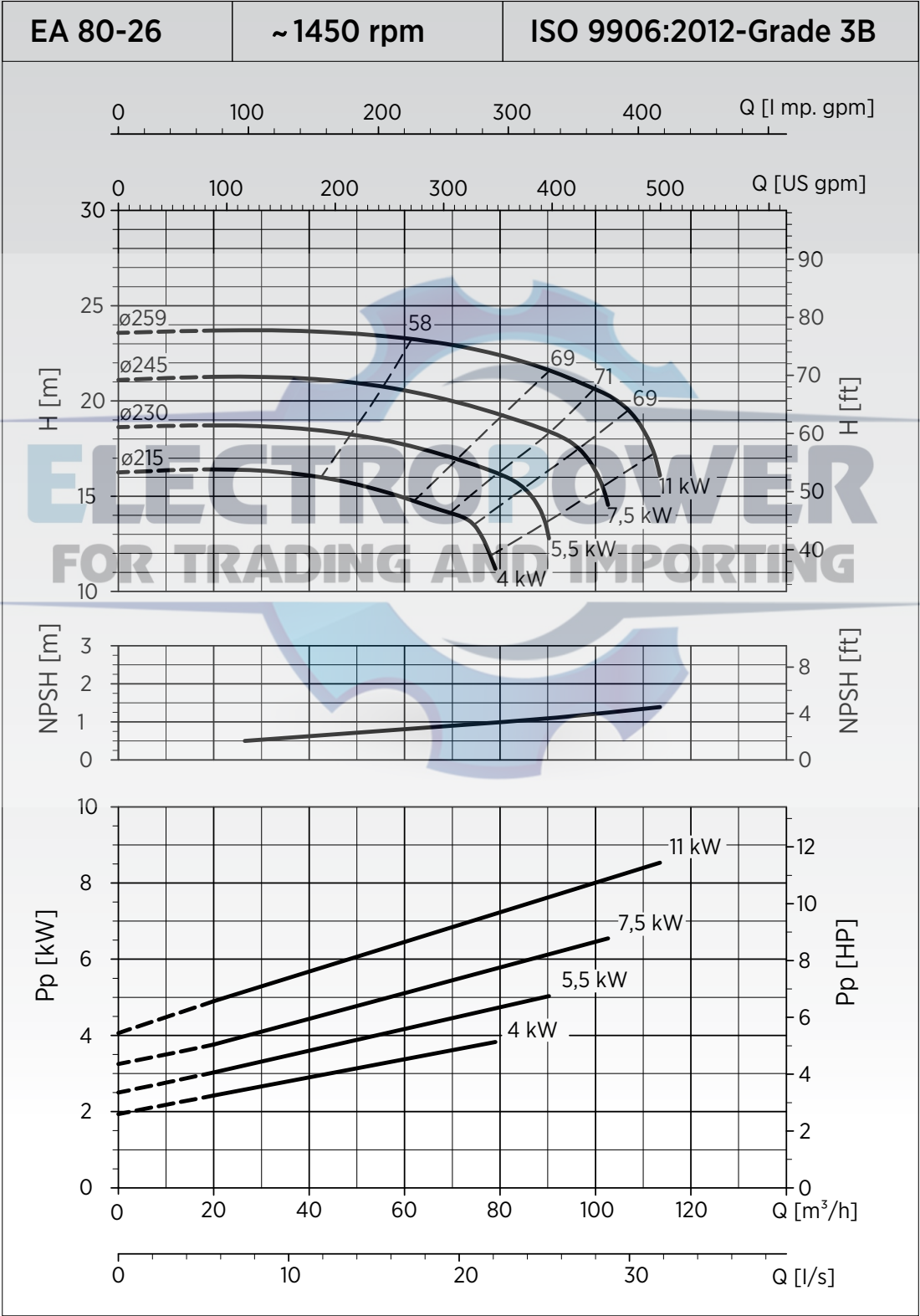
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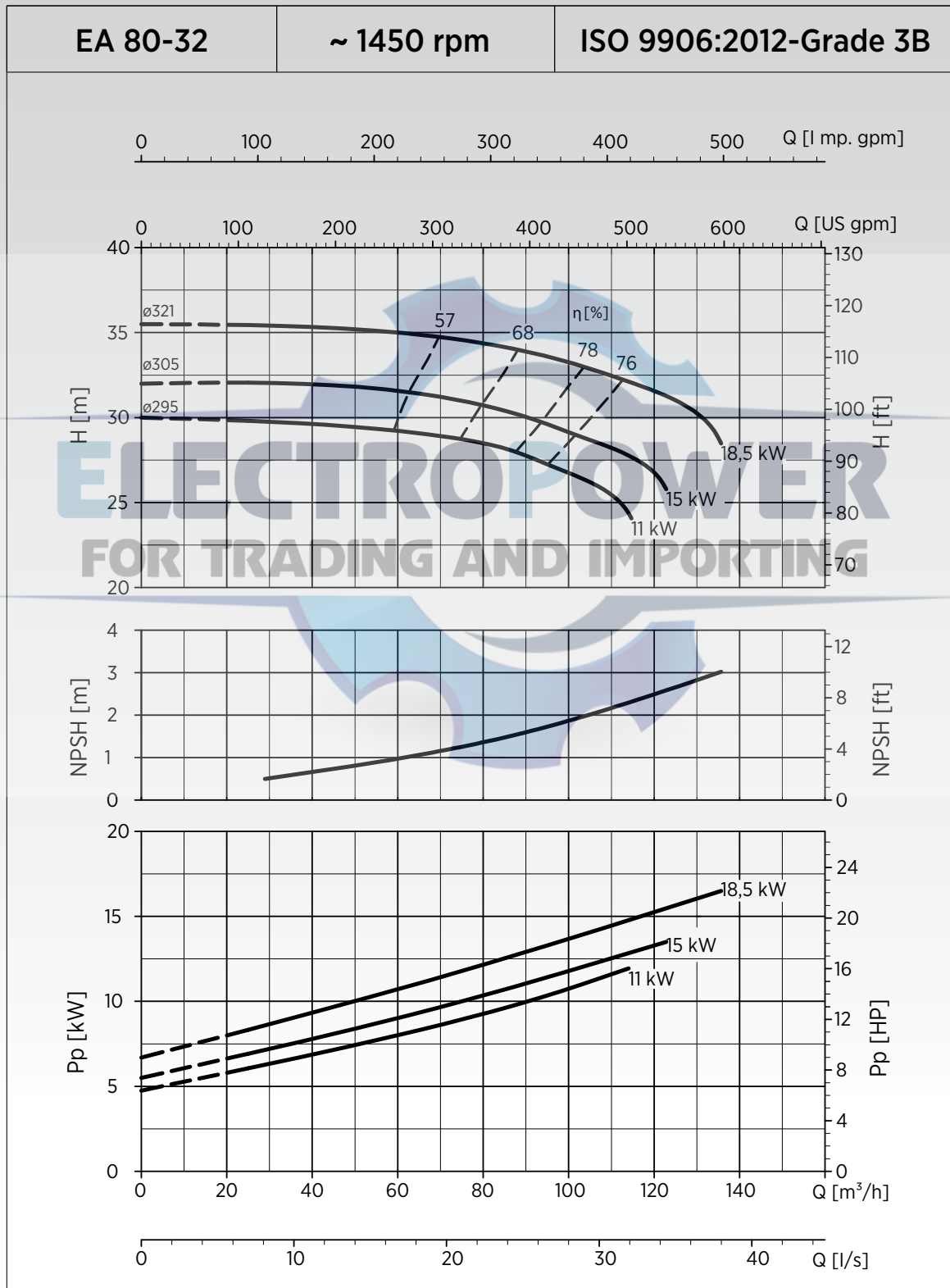
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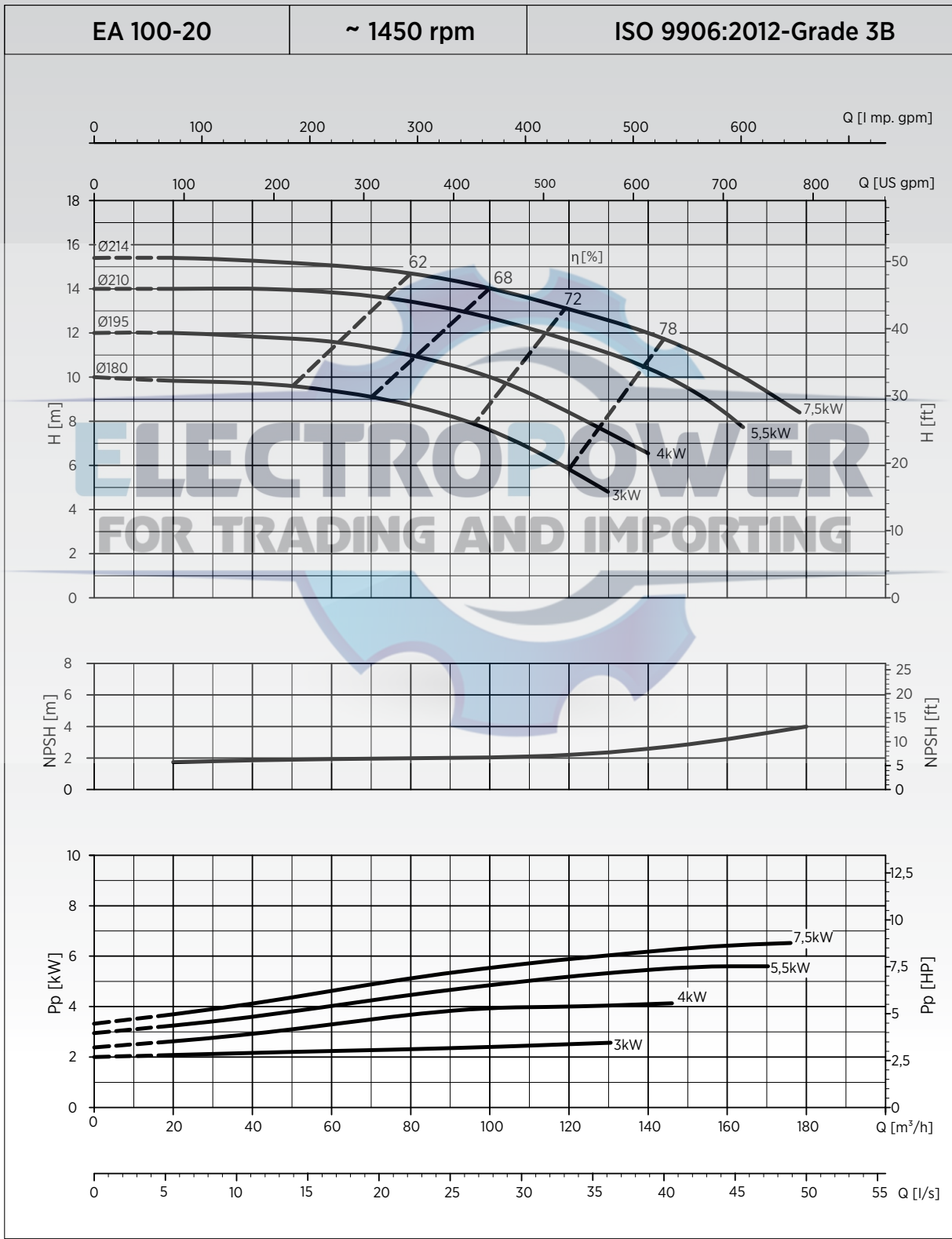
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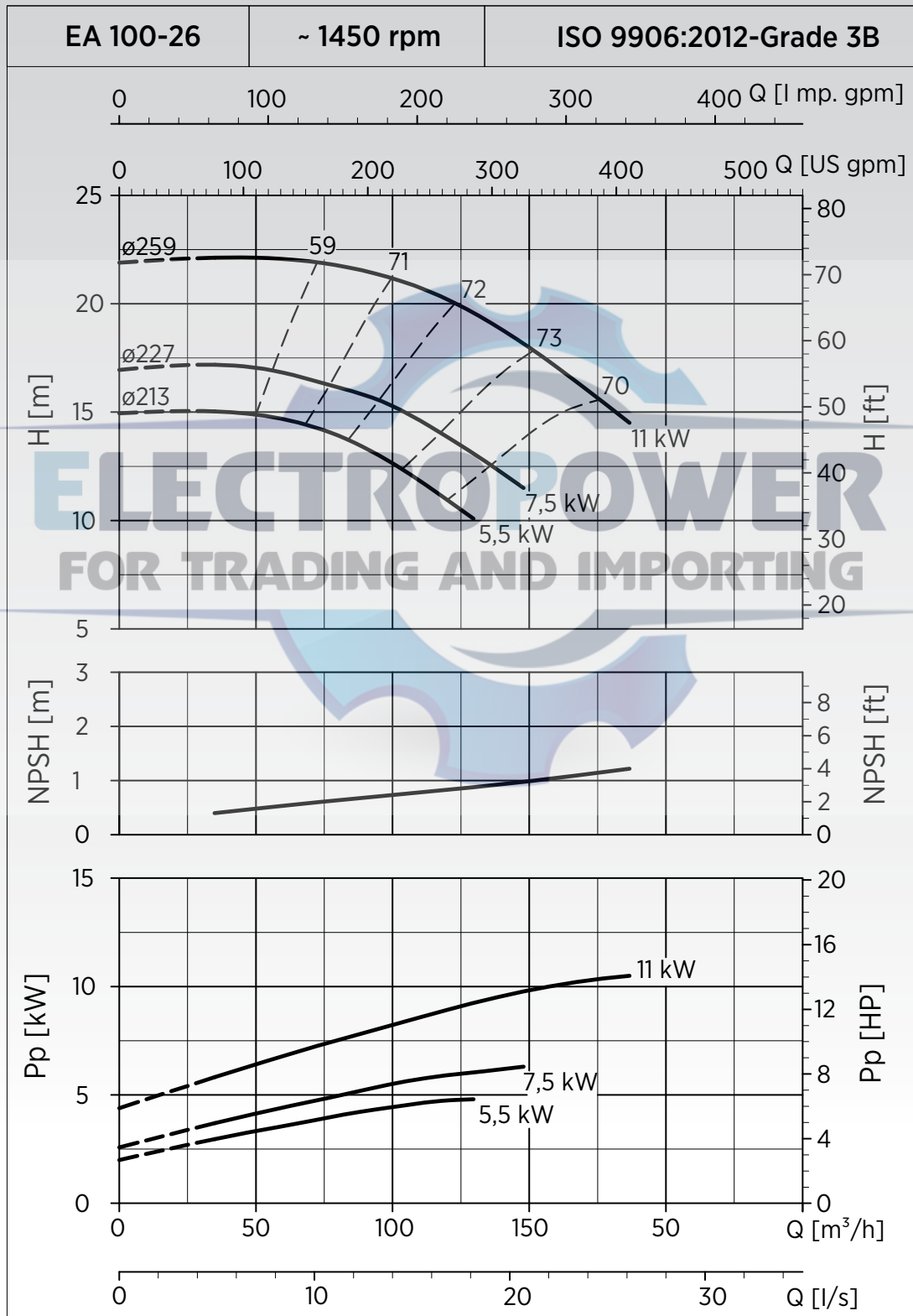
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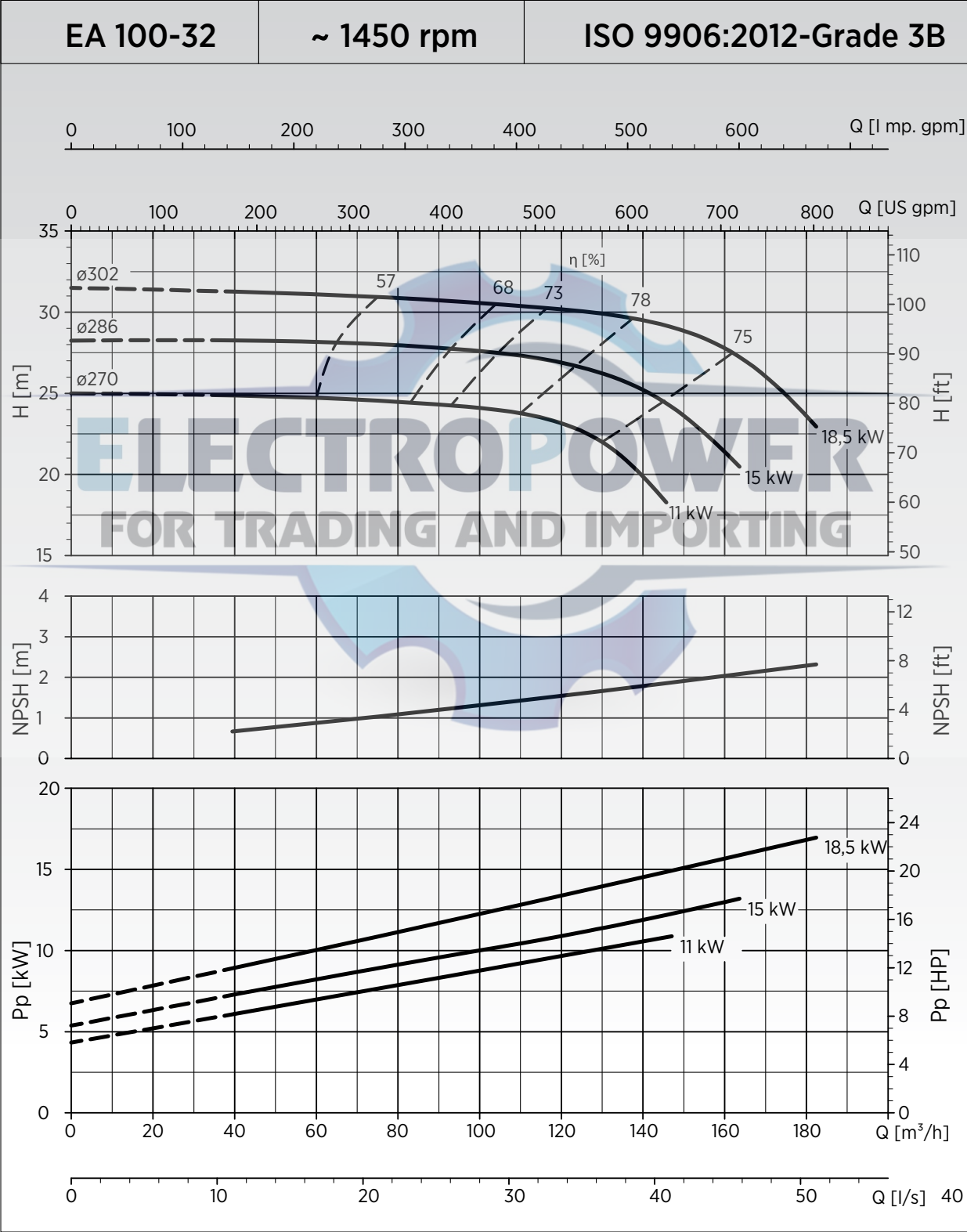
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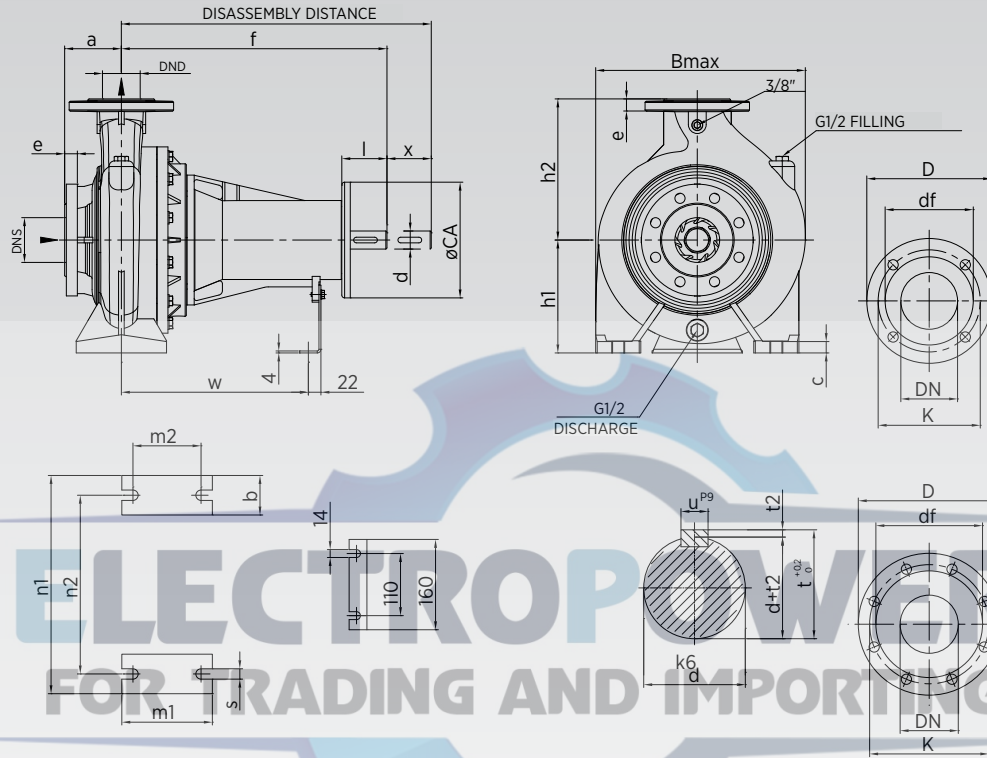
HYDRAULIC PERFORMANCE CURVES



HYDRAULIC PERFORMANCE CURVES



EA NORM PUMPS DIMENSIONS AND WEIGHTS

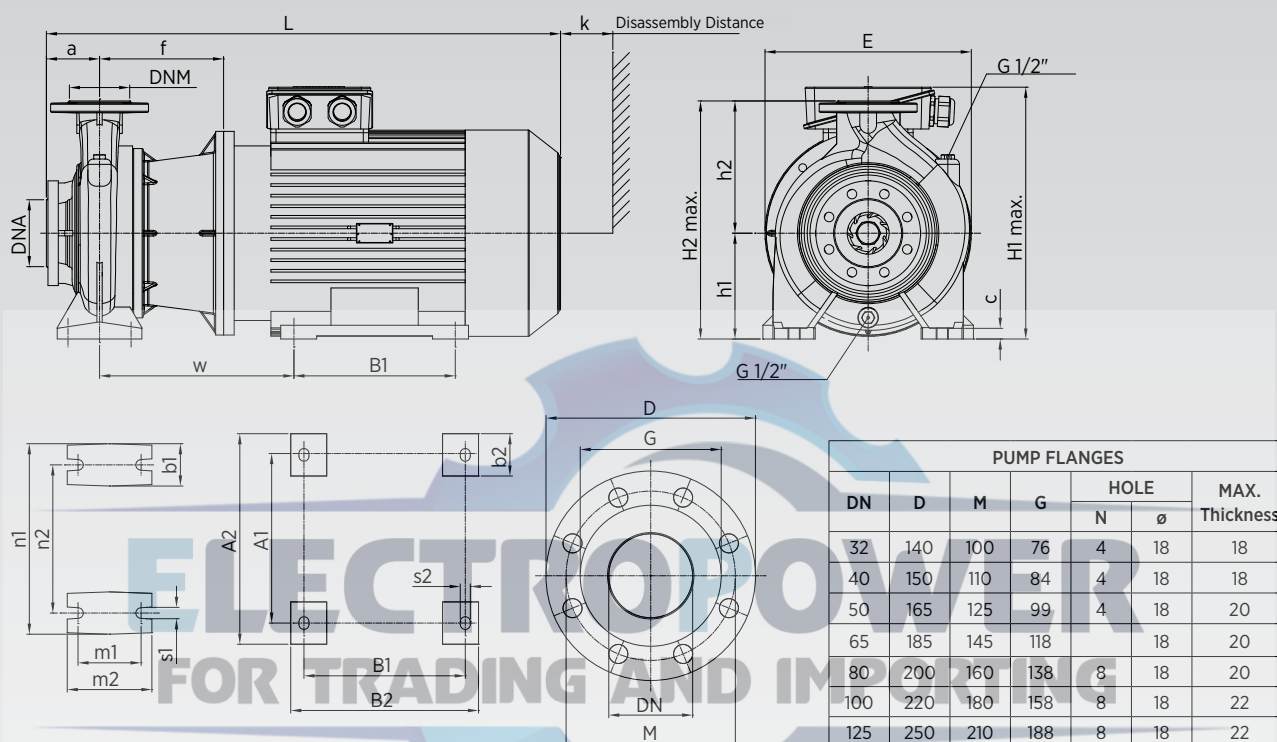


EN1092-2, PN 16 *						ASME B16.5 Class 150 RF *					
DN	D	K	e	df	L	DN	D	K	e	df	L
32	140	100	18	76	4x19	1 1/4	140	89	18	63.5	4x19
40	150	110	18	84	4x19	1 1/2	150	98.5	18	73	4x19
50	165	125	20	99	4x19	2	165	120.5	20	92	4x19
65	185	145	20	118	4x19	2 1/2	185	139.5	20	105	4x19
80	200	160	22	132	8x19	3	200	152.5	22	127	8x19
100	220	180	24	157	8x19	4	220	190.5	24	157	8x19
125	250	210	24	157	8x19	5	250	216	24	186	8x19

TOLERANCE TABLE		
DIAMETER	CODE	T. VALUES
ø42	k6	+0.018
		+0.002
		+0.018
ø32	k6	+0.002
		+0.015
		+0.002
ø24	k6	-0.015
		-0.051
		-0.018
8-10	P9	-0.018
		-0.061

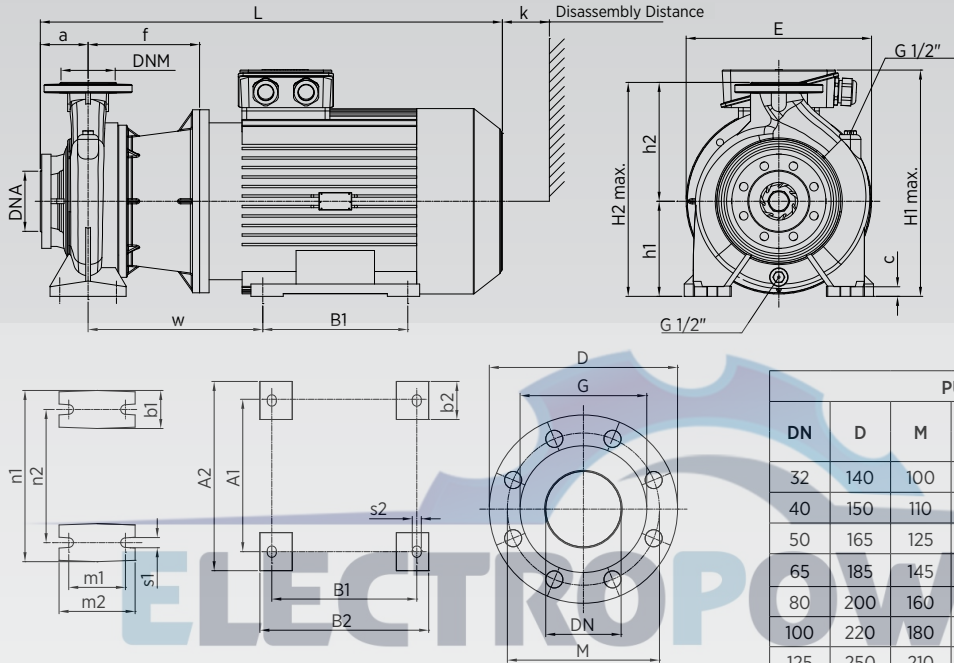
PUMP MODEL	DIMENSIONS (mm)																					
	PUMP							FOOT								SHAFT				B	X	Weight (kg)
	DND	DNS	a	f	h1	h2	øCA	b	c	m1	m2	n1	n2	s	w	d	u	t	l			
EA 32/20	50	32	80	355	160	180	205	65	14	100	60	240	190	12	265	28	8	31	40	330	100	42
EA 32/26	32	50	100	360	180	225	205	65	14	126	95	320	260	14	239	24	40	27	8	330	100	52
EA 40/20	65	40	100	355	160	100	205	65	14	180	92	266	212	12	265	28	8	31	40	330	110	45
EA 40/26	40	65	100	360	180	225	205	65	14	126	95	320	255	14	234	24	40	27	8	330	110	58
EA 40/32	65	40	100	465	200	250	205	65	14	126	88	350	280	16	334	32	10	35	80	340	112	67
EA 50/20	65	50	100	355	160	200	205	65	14	100	72	266	212	12	265	28	8	31	40	340	112	50
EA 50/26	50	65	100	360	180	225	205	65	14	125	95	320	250	14	260	24	50	27	8	340	112	60
EA 50/32	50	65	125	470	225	280	205	65	16	125	95	345	280	18	340	32	80	35	10	434	112	68
EA 65/20	80	65	100	355	180	225	205	80	16	126	90	320	250	12	265	28	8	31	40	360	112	62
EA 65/26	65	80	100	470	200	250	205	80	16	160	120	360	280	18	340	32	80	35	10	360	112	73.4
EA 65/32	65	80	125	470	225	280	205	80	14	160	120	400	315	18	340	32	80	35	10	434	112	95
EA 80/20	100	80	125	475	180	250	205	80	16	126	94	345	280	16	343	32	10	35	80	400	112	63
EA 80/26	80	100	125	470	200	280	205	80	16	160	120	400	315	18	340	32	80	35	10	400	112	86
EA 80/32	80	100	125	470	250	315	205	80	16	160	120	400	315	18	340	42	80	45.7	12	451	112	111
EA 100/20	125	100	125	475	200	280	205	80	18	160	119	360	280	20	345	32	10	35	80	425	112	87
EA 100/26	100	125	140	470	225	280	205	80	18	160	120	400	315	18	340	32	80	35	10	425	112	94
EA 100/32	100	125	140	470	250	315	205	80	18	160	120	400	315	18	340	42	80	45	12	472	116	117

EAR SERIES PUMP DIMENSIONS AND WEIGHTS 50 Hz, 2 POLES



PUMP TYPE	1450 rpm		DIMENSIONS																										Weight (kg)
	kW	DNM	DNA	a	f	w	h1	h2	b1	b2	c	m1	m2	n1	n2	s1	s2	A1	A2	B1	B2	Lm	E	H1 Max	H2 Max	L	k		
EAR 32/20	2.2	50	32	80	176	232	160	180	54	43	13	102	79	244	190	12	12	140	180	125	155	284	250	340	286	540	150	68.0	
EAR 32/20	3	50	32	80	176	239	160	180	54	47	13	102	79	244	190	12	13	160	200	140	175	316	250	340	294	572	150	77.0	
EAR 32/20	4	50	32	80	176	246	160	180	54	47	13	102	79	244	190	12	13	190	230	140	175	336	250	340	305	592	150	87.0	
EAR 32/20	5.5	50	32	80	189	278	160	180	54	49	15	102	79	244	190	12	15	216	260	140	180	413	250	340	328	682	150	109.0	
EAR 32/26	7.5	50	32	100	196	285	180	225	65	49	15	126	95	320	260	14	15	216	260	178	218	413	330	405	310	709	150	123.0	
EAR 32/26	11	50	32	100	208	316	180	225	65	60	21.5	126	95	320	260	14	21	254	312	210	304	490	330	405	310	798	150	170.0	
EAR 32/26	15	50	32	100	208	316	180	225	65	60	21.5	126	95	320	260	14	21	254	312	254	304	490	330	405	310	798	150	182.0	
EAR 40/20	4	65	40	100	178	248	160	180	54	47	15	102	77	270	214	12	13	190	230	140	175	336	250	340	305	614	150	90.0	
EAR 40/20	5.5	65	40	100	191	280	160	180	54	49	15	102	77	270	214	12	15	216	260	140	180	413	250	340	328	704	150	112.0	
EAR 40/20	7.5	65	40	100	191	280	160	180	54	49	15	102	77	270	214	12	15	216	260	178	218	413	250	340	328	704	150	116.0	
EAR 40/20	11	65	40	100	231	339	160	180	54	60	21.5	102	77	270	214	12	21	254	312	210	304	490	250	340	305	821	150	176.0	
EAR 40/26	11	65	40	100	208	316	180	225	65	60	21.5	126	95	244	260	12	21	254	312	210	304	490	330	405	325	798	150	176.0	
EAR 40/26	15	65	40	100	208	316	180	225	65	60	21.5	126	95	244	260	12	21	254	312	254	304	490	330	405	325	798	150	188.0	
EAR 40/26	18.5	65	40	100	234	355	180	225	65	60	21.5	126	95	244	260	12	21	279	354	241	320	550	330	405	325	884	150	208.0	
EAR 40/26	22	65	40	100	234	355	180	225	65	68	24	126	95	244	260	12	21	279	354	279	320	550	330	405	325	884	150	233.0	
EAR 40/26	30	65	40	100	234	367	180	225	65	80	26	126	95	244	260	12	26	318	398	305	355	637	330	405	325	971	150	285.0	
EAR 50/20	7.5	65	50	110	186	275	160	200	61	49	15	108	80	269	216	12	15	216	260	178	218	413	280	360	305	709	150	121.0	
EAR 50/20	11	65	50	110	226	334	160	200	61	60	21.5	108	80	269	216	12	21	254	312	210	304	490	280	360	305	826	150	168.0	
EAR 50/20	15	65	50	110	226	334	160	200	61	60	21.5	108	80	269	216	12	21	254	312	254	304	490	280	360	305	826	150	180.0	
EAR 50/26	18.5	65	50	100	234	355	180	225	65	60	21.5	125	95	320	250	12	21	279	354	241	320	550	330	405	325	884	150	210.0	
EAR 50/26	22	65	50	100	234	355	180	225	65	68	24	125	95	320	250	12	21	279	354	279	320	550	330	405	325	884	150	235.0	
EAR 50/26	30	65	50	100	234	367	180	225	65	80	26	125	95	320	250	12	26	318	398	305	355	637	330	405	325	971	150	287.0	
EAR 50/26	37	65	50	100	234	367	180	225	65	80	26	125	95	320	250	12	26	318	398	305	355	637	330	405	325	971	150	315.0	
EAR 50/32	37	65	50	125	234	367	180	225	65	80	26	125	95	320	250	12	26	318	398	305	355	637	330	405	325	996	150	323.0	
EAR 65/20	15	80	65	104	227	335	180	225	69	60	21.5	136	109	323	186	12	21	254	312	254	304	490	300	405	325	821	150	192.0	
EAR 65/20	18.5	80	65	104	227	348	180	225	69	60	21.5	136	109	323	186	12	21	279	354	241	320	550	300	405	325	881	150	212.0	
EAR 65/20	22	80	65	140	227	348	180	225	69	68	24	136	109	323	186	12	21	279	354	279	320	550	300	405	325	917	150	237.0	
EAR 65/20	30	80	65	140	227	360	180	225	69	80	26	136	109	323	186	12	26	318	398	305	355	637	300	405	325	1004	150	289.0	
EAR 65/26	22	80	65	100	250	371	200	250	65	68	24	160	120	360	280	18	21	279	354	279	320	550	330	450	345	900	150	248.0	
EAR 65/26	30	80	65	100	250	383	200	250	65	80	26	160	120	360	280	18	26	318	398	305	355	637	330	450	345	987	150	300.0	
EAR 65/26	37	80	65	100	250	383	200	250	65	80	26	160	120	360	280	18	26	318	398	305	355	637	330	450	345	987	150	328.0	
EAR 80/20	18.5	100	80	130	247	368	180	250	72	60	21.5	126	102	280	201	16	21	279	354	241	320	550	300	430	325	927	150	213.0	
EAR 80/20	22	100	80	130	247	368	180	250	72	68	24	126	102	280	201	16	21	279	354	279	320	550	300	430	325	927	150	238.0	
EAR 80/20	30	100	80	130	247	380	180	250	72	80	26	126	102	280	201	16	26	318	398	305	355	637	300	430	325	1014	150	290.0	
EAR 80/20	37	100	80	130	247	380	180	250	72	80	26	126	102	280	201	16	26	318	398	305	355	637	300	430	325	1014	150	318.0	
EAR 80-26	37	100	80	125	250	383	200	280	65	80	26	160	120	400	315	18	26	318	398	305	355	637	330	480	345	1012	150	341.0	

EAR SERIES PUMP DIMENSIONS AND WEIGHTS 50 Hz, 4 POLES

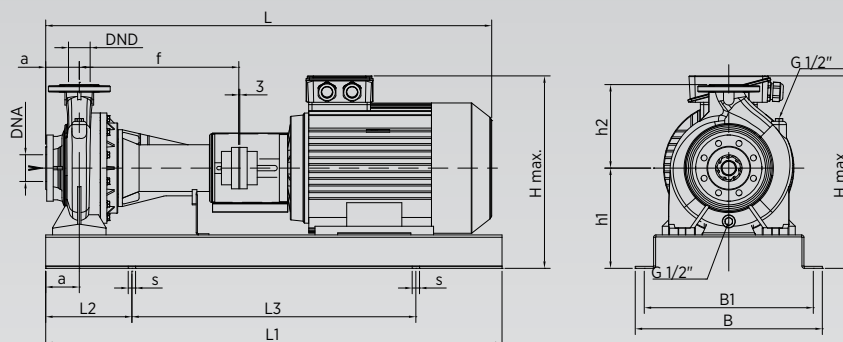


PUMP FLANGES

DN	D	M	G	HOLE		MAX. Thickness
				N	ø	
32	140	100	76	4	18	18
40	150	110	84	4	18	18
50	165	125	99	4	18	20
65	185	145	118	4	18	20
80	200	160	138	8	18	20
100	220	180	158	8	18	22
125	250	210	188	8	18	22

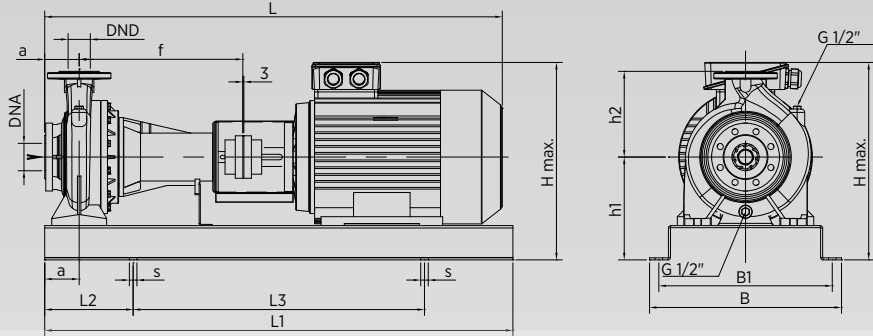
PUMP TYPE	1450 rpm			DIMENSIONS																										Weight (kg)
	kW	DNM	DNA	a	f	w	h1	h2	b1	b2	c	m1	m2	n1	n2	s1	s2	A1	A2	B1	B2	Lm	E	H1 Max	H2 Max	L	k			
EAR 32/20	0.75	50	32	80	141	191	160	180	54	43	13	102	79	244	190	12	12	140	180	125	155	284	250	340	270	505	150	59.0		
EAR 32/20	1.1	50	32	80	175	231	160	180	54	47	13	102	79	244	190	12	13	160	200	140	175	316	250	340	286	571	150	60.0		
EAR 32/20	1.5	50	32	80	176	232	160	180	54	47	13	102	79	244	190	12	13	190	230	140	175	336	250	340	286	592	150	64.0		
EAR 32/26	1.1	50	32	100	168	224	180	225	65	49	15	126	95	320	260	14	15	216	260	178	218	413	330	405	306	681	150	70.0		
EAR 32/26	1.5	50	32	100	168	224	180	225	65	60	21.5	126	95	320	260	14	21	254	312	210	304	490	330	405	306	758	150	74.0		
EAR 32/26	2.2	50	32	100	168	231	180	225	65	60	21.5	126	95	320	260	14	21	254	312	254	304	490	330	405	314	758	150	78.0		
EAR 32/26	3	50	32	100	168	231	180	225	65	60	21.5	126	95	320	260	14	21	254	312	254	304	490	330	405	314	758	151	87.0		
EAR 40/20	0.75	65	40	100	178	228	160	180	54	47	15	102	77	270	214	12	13	190	230	140	175	336	250	340	270	614	150	62.0		
EAR 40/20	1.1	65	40	100	178	234	160	180	54	49	15	102	77	270	214	12	15	216	260	140	180	413	250	340	286	691	150	63.0		
EAR 40/20	1.5	65	40	100	178	234	160	180	54	49	15	102	77	270	214	12	15	216	260	178	218	413	250	340	286	691	150	67.0		
EAR 40/20	2.2	65	40	100	178	241	160	180	54	49	15	102	77	270	214	12	15	216	260	178	218	413	250	340	294	691	151	78.0		
EAR 40/26	1.5	65	40	100	168	224	180	225	65	60	21.5	126	95	244	260	12	21	254	312	210	304	490	330	405	306	758	150	80.0		
EAR 40/26	2.2	65	40	100	168	231	180	225	65	60	21.5	126	95	244	260	12	21	254	312	254	304	490	330	405	314	758	150	84.0		
EAR 40/26	3	65	40	100	168	231	180	225	65	60	21.5	126	95	244	260	12	21	279	354	241	320	550	330	405	314	818	150	93.0		
EAR 50/20	1.1	65	50	110	172	228	160	200	61	49	15	108	80	269	216	12	15	216	260	178	218	413	280	360	286	695	150	68.0		
EAR 50/20	1.5	65	50	110	172	228	160	200	61	60	21.5	108	80	269	216	12	21	254	312	210	304	490	280	360	286	772	150	72.0		
EAR 50/20	2.2	65	50	110	172	235	160	200	61	60	21.5	108	80	269	216	12	21	254	312	254	304	490	280	360	294	772	150	76.0		
EAR 50/26	2.2	65	50	100	168	231	180	225	65	60	21.5	125	95	320	250	12	21	279	354	241	320	550	330	405	314	818	150	86.0		
EAR 50/26	3	65	50	100	168	231	180	225	65	68	24	125	95	320	250	12	21	279	354	279	320	550	330	405	314	818	150	95.0		
EAR 50/26	4	65	50	100	168	238	180	225	65	80	26	125	95	320	250	12	26	318	398	305	355	637	330	405	325	905	150	105.0		
EAR 50/26	5.5	65	50	100	195	284	180	225	65	80	26	125	95	320	250	12	26	318	398	305	355	637	330	405	325	932	150	127.0		
EAR 65/20	1.5	80	65	104	174	230	180	225	69	60	21.5	136	109	323	186	12	21	254	312	254	304	490	300	405	325	768	150	84.0		
EAR 65/20	2.2	80	65	104	174	237	180	225	69	60	21.5	136	109	323	186	12	21	279	354	241	320	550	300	405	325	828	150	88.0		
EAR 65/20	3	80	65	140	174	237	180	225	69	68	24	136	109	323	186	12	21	279	354	279	320	550	300	405	325	864	150	97.0		
EAR 65/20	4	80	65	140	174	244	180	225	69	80	26	136	109	323	186	12	26	318	398	305	355	637	300	405	325	951	150	107.0		
EAR 65/26	4	80	65	100	184	254	200	250	65	68	24	160	120	360	280	18	21	279	354	279	320	550	330	450	345	834	150	118.0		
EAR 65/26	5.5	80	65	100	211	300	200	250	65	80	26	160	120	360	280	18	26	318	398	305	355	637	330	450	368	948	150	140.0		
EAR 65/26	7.5	80	65	100	211	300	200	250	65	80	26	160	120	360	280	18	26	318	398	305	355	637	330	450	368	948	150	144.0		
EAR 80/20	3	100	80	130	247	310	180	250	72	68	24	126	102	280	201	16	21	279	354	279	320	550	300	430	314	927	150	98.0		
EAR 80/20	4	100	80	130	247	317	180	250	72	80	26	126	102	280	201	16	26	318	398	305	355	637	300	430	325	1014	150	108.0		
EAR 80/20	5.5	100	80	130	247	336	180	250	72	80	26	126	102	280	201	16	26	318	398	305	355	637	300	430	348	1014	150	130.0		
EAR 80-26	4	100	80	125	250	320	200	280	65	80	26	160	120	400	315	18	26	318	398	305	355	637	330	480	345	1012	150	131.0		
EAR 80-26	5.5	100	80	125	211	300	200	280	65	80	26	160	120	400	315	18	26	318	398	305	355	637	330	480	368	973	150	153.0		
EAR 80-26	7.5	100	80	125	211	300	200	280	65	80	26	160	120	400	315	18	26	318	398	305	355	637	330	480	368	973	150	157.0		
EAR 80-26	11	100	80	125	250	358	200	280	65	80	26	160	120	400	315	18	26	318	398	305	355	637	330	480	423	1012	150	204.0		
EAR 100-20	3	125	100	127	196	259	200	280	77	68	24	163	130	360	285	20	21	279	354	279	320	550	300	480	334	873	150	122.0		
EAR 100-20	4	125	100	127	296	366	200	280	77	68	24	163	130	360	285	20	26	318	398	305	355	637	300	480	345	1060	150	132.0		
EAR 100-20	5.5	125	100	127	124	313	200	280	77	68	24	163	130	360	285	20	26	318	398	305	355	637	300	480	345	888	150	154.0		
EAR 100-20	7.5	125	100	125	124	313	200	280	77	68	24	163	130	360	285	20	26	318	398	305	355	637	300	480	368	886	150	158.0		
EAR 100-26	5.5	125	100	125	211	300	200	280	65	68	24	160	120	400	315	18	26	318	398	305	355	637	300	480	368	973	150	161.0		
EAR 100-26	7.5	125	100	125	211	300	200	280	65	68	24	160	120	400	315	18	26	318	398	305	355	637	300	480	368	973	150	165.0		
EAR 100-26	11	125	100	125	250	358	200	280	65	80	24	160	120	400	315	18	26	318	398	305	355	637	330	480	423	1012	150	212.0		

EAS SERIES PUMP DIMENSIONS AND WEIGHTS 50 Hz, 2 POLES



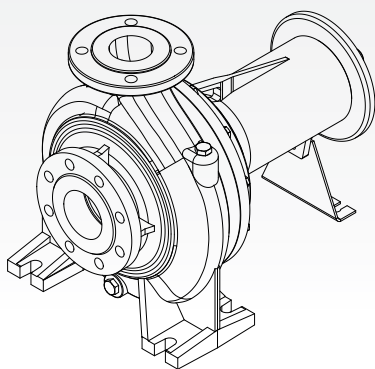
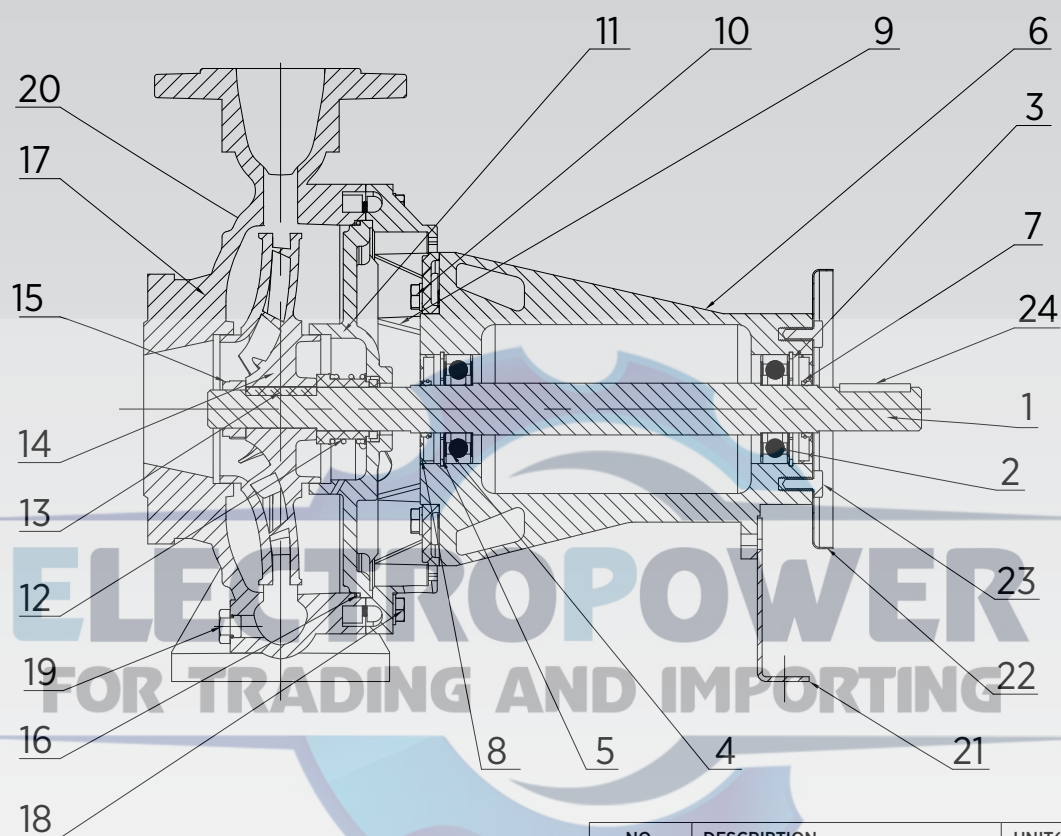
PUMP TYPE	2950 rpm		DIMENSIONS													Weight (kg)
	kW	DND	DNA	a	h1	h2	B	B2	L	L1	L2	L3	s	H1 Max	H2 Max	
EAS 32/20	5.5	50	32	80	260	180	560	510	884	950	150	650	ø18	440	357	146
EAS 32/20	7.5	50	32	80	260	180	560	510	961	950	150	650	ø18	440	400	150
EAS 32/20	11	50	32	80	260	180	560	510	961	950	150	650	ø18	440	400	197
EAS 32/26	7.5	50	32	100	250	225	560	510	986	950	150	650	ø18	475	400	207
EAS 32/26	11	50	32	100	250	225	-200	-250	0	950	150	650	ø18	475	0	210
EAS 32/26	15	50	32	100	250	225	560	510	986	950	150	650	ø18	475	400	219
EAS 40/20	7.5	65	40	100	260	180	560	510	981	950	150	650	ø18	440	400	153
EAS 40/20	11	65	40	100	260	180	560	510	981	950	150	650	ø18	440	400	200
EAS 40/20	15	65	40	100	260	180	560	510	1083	1100	150	800	ø18	440	480	217
EAS 40/26	11	65	40	100	250	225	560	510	986	950	150	650	ø18	475	400	213
EAS 40/26	15	65	40	100	250	225	560	510	1088	1100	175	750	ø18	475	480	230
EAS 40/26	18.5	65	40	100	250	225	560	510	1147	1100	175	750	ø18	475	521	252
EAS 40/26	22	65	40	100	250	225	560	510	1185	1100	175	750	ø18	475	577	277
EAS 50/20	11	65	50	100	260	200	560	510	981	950	125	700	ø18	460	400	205
EAS 50/20	15	65	50	100	260	200	560	510	1083	1100	175	750	ø18	460	480	222
EAS 50/20	18.5	65	50	100	260	200	560	510	1142	1100	175	750	ø18	460	521	244
EAS 50/20	22	65	50	100	260	200	560	510	1180	1100	175	750	ø18	460	577	269
EAS 50/26	22	65	50	100	250	225	560	510	1185	1100	175	750	ø18	475	577	279
EAS 50/26	30	65	50	100	250	225	560	510	1241	1250	250	750	ø18	475	577	338
EAS 50/26	37	65	50	100	250	225	560	510	1241	1250	250	750	ø18	475	577	366
EAS 50/26	45	65	50	100	250	225	600	550	1295	1300	275	750	ø18	475	610	437
EAS 50/32	37	65	50	125	325	280	600	550	1376	1400	325	750	ø18	605	577	382
EAS 50/32	45	65	50	125	325	280	600	550	1430	1400	325	750	ø20	605	610	449
EAS 50/32	55	65	50	125	325	280	710	660	1531	1500	375	750	ø20	605	672	551
EAS 50/32	75	65	50	125	325	280	600	550	1593	1600	425	750	ø20	605	730	661
EAS 65/20	18.5	80	65	180	280	325	560	510	1142	1100	175	750	ø20	605	521	256
EAS 65/20	22	80	65	180	280	325	560	510	1180	1100	175	750	ø20	605	577	281
EAS 65/20	30	80	65	180	280	325	560	510	1236	1250	250	750	ø20	605	577	340
EAS 65/20	37	80	65	180	280	325	560	510	1236	1250	250	750	ø20	605	577	368
EAS 65/26	30	80	65	100	270	250	600	550	1351	1400	325	750	ø20	520	577	359
EAS 65/26	37	80	65	100	270	250	600	550	1351	1400	325	750	ø20	520	577	387
EAS 65/26	45	80	65	100	270	250	600	550	1405	1400	325	750	ø20	520	610	454
EAS 65/26	55	80	65	100	270	250	710	660	1506	1500	375	750	ø20	520	672	556
EAS 65/32	55	80	65	125	325	225	710	660	1531	1500	375	750	ø20	550	672	578
EAS 65/32	75	80	65	125	325	225	710	660	1593	1600	425	750	ø20	550	730	719
EAS 65/32	90	80	65	125	325	225	710	660	1601	1600	425	750	ø20	550	730	776
EAS 80/20	18.5	100	80	125	280	250	560	510	1287	1300	275	750	ø20	530	521	264
EAS 80/20	22	100	80	125	280	250	560	510	1325	1300	275	750	ø20	530	577	289
EAS 80/20	30	100	80	125	280	250	560	510	1381	1400	325	750	ø20	530	577	347
EAS 80/20	37	100	80	125	280	250	560	510	1381	1400	325	750	ø20	530	577	375
EAS 80/20	45	100	80	125	280	250	600	550	1435	1400	325	750	ø20	530	610	444
EAS 80-26	37	100	80	125	300	280	600	550	1376	1400	325	750	ø20	580	577	400
EAS 80-26	45	100	80	125	300	280	600	550	1430	1400	325	750	ø20	580	610	467
EAS 80-26	55	100	80	125	300	280	600	550	1531	1500	375	750	ø20	580	672	539
EAS 80-26	75	100	80	125	300	280	600	550	1593	1600	425	750	ø20	580	730	679
EAS 80-32	90	100	80	125	350	315	710	660	1601	1600	425	750	ø20	665	730	791
EAS 80-32	110	100	80	125	350	315	710	660	1793	1800	475	850	ø20	665	925	1171
EAS 80-32	132	100	80	125	350	315	510	460	1793	1800	475	850	ø20	665	925	1311
EAS 80-32	160	100	80	125	350	315	710	660	1793	1800	475	850	ø20	665	925	1391
EAS 100-20	30	125	100	125	300	280	600	550	1381	1400	325	750	ø20	580	577	373
EAS 100-20	37	125	100	125	300	280	600	550	1381	1400	325	750	ø20	580	577	401
EAS 100-20	45	125	100	125	300	280	600	550	1435	1400	325	750	ø20	580	610	468
EAS 100-20	55	125	100	125	300	280	710	660	1536	1500	375	750	ø20	580	672	548
EAS 100-26	45	125	100	140	295	280	600	550	1430	1400	325	750	ø20	575	610	475
EAS 100-26	55	125	100	140	295	280	710	660	1531	1500	375	750	ø20	575	672	577
EAS 100-26	75	125	100	140	295	280	710	660	1593	1600	425	750	ø20	575	730	718
EAS 100-26	90	125	100	140	295	280	710	660	1601	1600	425	750	ø20	575	730	775
EAS 100-32	110	125	100	140	350	315	710	660	1793	1800	475	850	ø20	665	925	1218
EAS 100-32	132	125	100	140	350	315	710	660	1793	1800	475	850	ø20	665	925	1318
EAS 100-32	160	125	100	140	350	315	710	660	1793	1800	475	850	ø20	665	925	1398

EAS SERIES PUMP DIMENSIONS AND WEIGHTS 50 Hz, 4 POLES



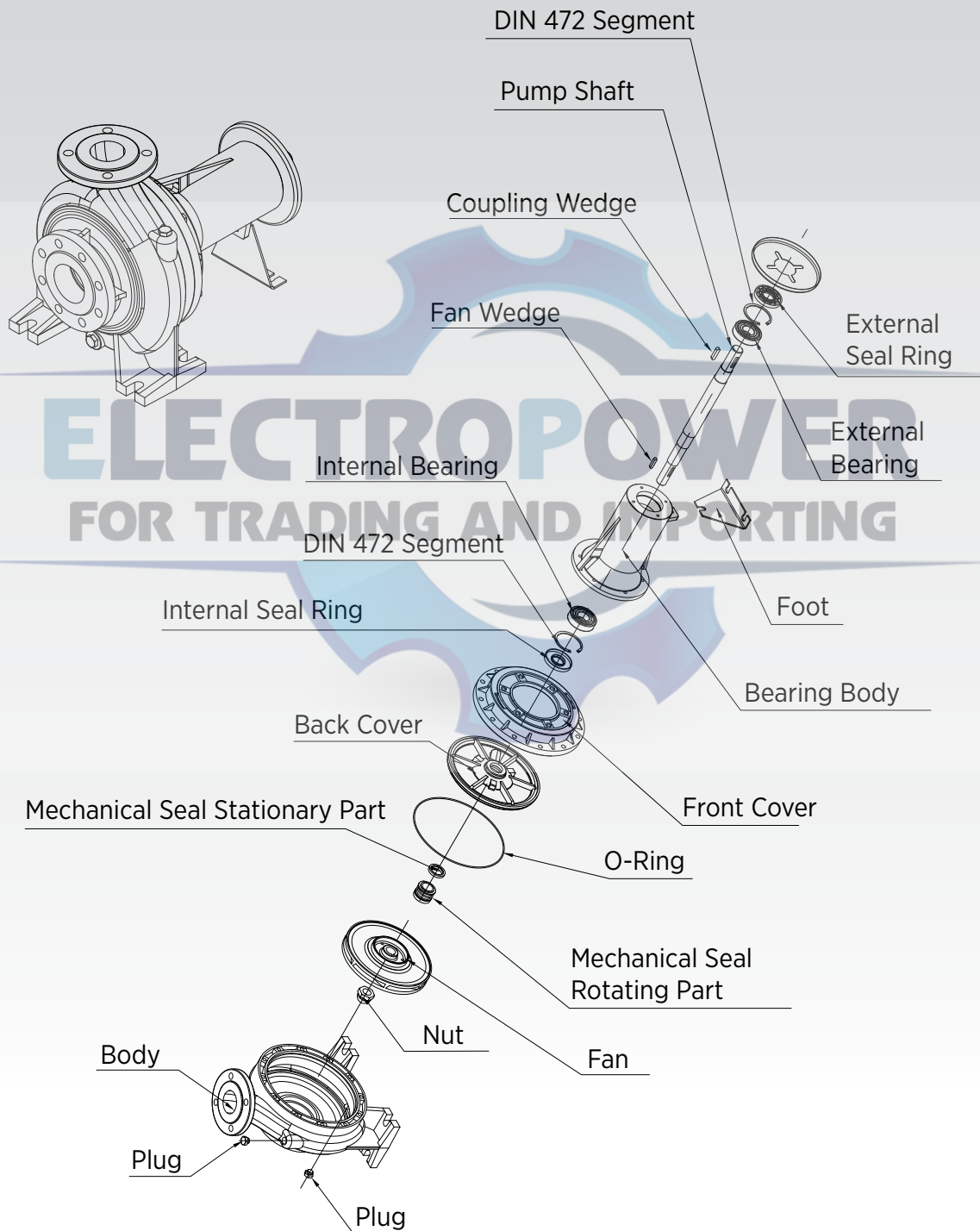
PUMP TYPE	2950 rpm			DIMENSIONS													Weight (kg)
	kW	DND	DNA	a	h1	h2	B	B2	L	L1	L2	L3	s	H1 Max	H2 Max		
EAS 32/20	0.75	50	32	80	210	180	430	380	742	750	100	550	ø18	248	390	81.5	
EAS 32/20	1.1	50	32	80	210	180	430	380	772	750	100	550	ø18	266	390	86.5	
EAS 32/20	1.5	50	32	80	210	180	430	380	797	800	100	600	ø18	266	390	91.8	
EAS 32/26	1.1	50	32	100	200	225	510	460	488	750	100	550	ø18	50	425	99.4	
EAS 32/26	1.5	50	32	100	200	225	510	460	488	750	100	550	ø18	50	425	111.4	
EAS 32/26	2.2	50	32	100	200	225	510	460	488	750	100	550	ø18	50	425	111.4	
EAS 32/23	3	50	32	100	200	225	510	460	488	750	100	550	ø18	50	425	114.4	
EAS 40/20	0.75	65	40	100	210	180	430	380	762	750	100	550	ø18	248	390	84.5	
EAS 40/20	1.1	65	40	100	210	180	430	380	792	800	100	600	ø18	266	390	90.8	
EAS 40/20	1.5	65	40	100	210	180	430	380	817	800	100	600	ø18	266	390	94.8	
EAS 40/20	2.2	65	40	100	200	225	430	380	864	800	100	600	ø18	284	425	115.8	
EAS 40/26	1.5	65	40	100	200	225	510	460	822	800	100	600	ø18	266	425	110.8	
EAS 40/26	2.2	65	40	100	200	225	510	460	864	800	100	600	ø18	284	425	118.8	
EAS 40/26	3	65	40	100	200	225	510	460	894	900	100	700	ø18	284	425	124.7	
EAS 40/32	2.2	65	40	100	250	250	510	460	969	900	100	700	ø18	284	500	104.8	
EAS 40/32	3	65	40	100	200	250	510	460	999	900	100	700	ø18	284	450	104.8	
EAS 40/32	4	65	40	100	200	250	510	460	1014	1000	100	800	ø18	307	450	51.8	
EAS 40/32	5.5	65	40	100	200	250	510	460	1053	1000	100	800	ø18	350	450	69.8	
EAS 50/20	1.1	65	50	100	210	200	430	380	792	800	100	600	ø18	266	410	95.8	
EAS 50/20	1.5	65	50	100	210	200	430	380	817	800	100	600	ø18	266	410	99.8	
EAS 50/20	2.2	65	50	100	210	200	430	380	859	800	100	600	ø18	284	410	107.8	
EAS 50/26	2.2	65	50	100	200	225	510	460	864	800	100	600	ø18	284	425	120.8	
EAS 50/26	3	65	50	100	200	225	510	460	894	900	100	700	ø18	284	425	126.7	
EAS 50/26	4	65	50	100	200	225	510	460	909	900	100	700	ø18	307	425	137.7	
EAS 50/26	5.5	65	50	100	200	225	510	460	948	900	100	700	ø20	350	425	155.7	
EAS 50/32	4	65	50	125	275	280	510	460	1044	1000	125	750	ø20	307	555	148.6	
EAS 50/32	5.5	65	50	125	275	280	510	460	1083	1100	175	750	ø20	350	555	169.4	
EAS 50/32	7.5	65	50	125	275	280	510	460	1121	1100	175	750	ø20	350	555	193.0	
EAS 50/32	11	65	50	125	275	280	510	460	1223	1100	175	750	ø20	430	555	226.4	
EAS 65/20	1.5	80	65	180	230	325	510	460	817	800	100	600	ø20	266	555	114.8	
EAS 65/20	2.2	80	65	180	230	325	510	460	859	800	100	600	ø20	284	555	122.8	
EAS 65/20	3	80	65	180	230	325	510	460	889	900	100	700	ø20	284	555	128.7	
EAS 65/20	4	80	65	180	230	325	510	460	904	900	100	700	ø20	307	555	139.7	
EAS 65/26	4	80	65	100	220	250	510	460	1019	1000	125	750	ø20	307	470	153.6	
EAS 65/26	5.5	80	65	100	220	250	510	460	1058	1000	125	750	ø20	350	470	171.6	
EAS 65/26	7.5	80	65	100	220	250	510	460	1096	1100	175	750	ø20	350	470	187.4	
EAS 65/32	4	80	65	125	275	225	560	510	1044	1000	125	750	ø20	307	500	188.3	
EAS 65/32	5.5	80	65	125	275	225	560	510	1083	1100	175	750	ø20	350	500	210.5	
EAS 65/32	7.5	80	65	125	275	225	560	510	1121	1100	175	750	ø20	350	500	223.5	
EAS 80/20	3	100	80	125	230	250	510	460	1034	1000	125	750	ø20	284	480	132.6	
EAS 80/20	4	100	80	125	230	250	510	460	1049	1000	125	750	ø20	307	480	143.6	
EAS 80/20	5.5	100	80	125	230	250	510	460	1088	1100	175	750	ø20	350	480	164.4	
EAS 80-26	4	100	80	125	250	280	560	510	1044	1000	125	750	ø20	307	530	168.9	
EAS 80-26	5.5	100	80	125	250	280	560	510	1083	1100	175	750	ø20	350	530	190.0	
EAS 80-26	7.5	100	80	125	250	280	560	510	1121	1100	175	750	ø20	350	530	203.0	
EAS 80-26	11	100	80	125	250	280	560	510	1223	1200	225	750	ø20	430	530	250.2	
EAS 80-32	11	100	80	125	300	315	560	510	1223	1200	225	750	ø20	430	615	286.6	
EAS 80-32	15	100	80	125	300	315	560	510	1267	1200	225	750	ø20	430	615	297.2	
EAS 80-32	11	100	80	125	300	315	560	510	1223	1200	225	750	ø20	430	615	336.8	
EAS 100-20	3	125	100	125	250	280	560	510	1034	1000	125	750	ø20	284	530	158.9	
EAS 100-20	4	125	100	125	250	280	560	510	1049	1000	125	750	ø20	307	530	169.9	
EAS 100-20	5.5	125	100	125	250	280	560	510	1088	1100	175	750	ø20	350	530	191.0	
EAS 100-20	7.5	125	100	125	250	280	560	510	1126	1100	175	750	ø20	350	530	204.0	
EAS 100-26	5.5	125	100	140	245	280	560	510	1083	1100	175	750	ø20	350	525	198.0	
EAS 100-26	7.5	125	100	140	245	280	560	510	1121	1100	175	750	ø20	350	525	222.5	
EAS 100-26	11	125	100	140	245	280	560	510	1223	1200	225	750	ø20	430	525	270.6	
EAS 100-32	11	125	100	140	300	315	560	510	1223	1200	225	750	ø20	430	615	343.8	
EAS 100-32	15	125	100	140	300	315	560	510	1267	1250	250	750	ø20	430	615	366.8	
EAS 100-32	18.5	125	100	140	300	315	560	510	1280	1250	250	750	ø20	471	615	388.8	

EA BARESHAFT PUMP ASSEMBLY



NO.	DESCRIPTION	UNIT(S)
1	PUMP SHAFT	1
2	BEARING OUTSIDE	1
3	SEGMENT OUTSIDE - DIN 472	1
4	BEARING INSIDE	1
5	SEGMENT INSIDE - DIN 472	1
6	BEARING BODY	1
7	SEAL RING OUTSIDE	1
8	SEAL RING INSIDE	1
9	FRONT COVER	1
10	BOLT WASHER GROUP	6
11	MECHANICAL SEAL BODY	1
12	MECHANICAL SEAL SET	1
13	FAN WEDGE	1
14	FAN	1
15	FAN FASTENING NUT	1
16	O-RING	1
17	BODY	1
18	BODY ATTACHMENT GROUP	12
19	PLUG	1
20	PLUG	1
21	FOOT	1
22	FLANGE	4
23	BOLT GROUP	1
24	COUPLING WEDGE	1

EA BARESHAFT PUMP ASSEMBLY



TECHNICAL APPENDIX

The minimum operating values are limited with the start of cavitation formed in the suction end of the pump.

Cavitation means the fluid pressure to locally drop down to a critical level or the local pressure to become equal or slightly lower than the vaporization pressure due to the formation of gaps full of vapor inside the fluid.

When these gaps full of vapor arrive to spots with higher pressure through flow, the vapor in these gaps condensates.

These gaps hit each other and create pressure waves on internal walls. This causes a stress cycle and an increasing deformation and abrasion.

This phenomenon is characterized as a metallic sound created by a hammer hitting the internal walls and called the 'start-up cavitation phase'.

The damage caused by cavitation causes the ambient temperature to increase due to electrochemical corrosion and plastic deformation of internal walls. Metals that are resistant to heat and corrosion are alloyed steels. The conditions triggering cavitation may be identified by calculating the total suction head. In technical literature:

NPSH (Net Positive Suction Head)

NPSH is the total energy measured under the cavitation start-up conditions, excluding the evaporation pressure (expressed in m) at the pump inlet. (expressed in m)

The following formula is used to find the static suction head (hz) under safe pump assembly conditions:

$$hp + hz \geq hz (NPSHr + 0.5) + hf + h_{pv}$$

hp: the absolute pressure applied to the free liquid surface in the suction tank. (expressed in m), hp is the quotient between the absolute pressure and the specific weight of the liquid.

hz: the suction head between the free liquid surface and the pump axis in the suction tank. (expressed in m), hz is negative if the liquid level is lower than the pump axis.

hf: total of suction line and accessories, valve and check valve elbows etc. friction (flow) resistances.

h_{pv}: evaporation pressure of the fluid under operating conditions. (expressed in m), h_{pv} is the quotient between the evaporation pressure and the specific weight of the liquid.

0.5: Safety factor. (for safety)

For assemblies, maximum possible suction head depends on atmospheric pressure values. (for example: the altitude of the pump's location above the sea level and the temperature of the fluid) As a reference to the users, the following table indicates the hydraulic suction loss in the given altitudes above sea level for 4 °C water, and similarly the thermal loss.

Water Temperature (°C)	20	40	60	80	90	110	120
Suction Loss (m)	0.2	0.7	2.0	5.0	7.4	15.4	21.5

Altitude Above Sea Level (m)	500	1000	1500	2000	2500	3000
Suction Loss (m)	0.55	1.1	1.65	2.2	2.75	3.3

EXAMPLE

Let us make the following calculation:

Water Temperature : 15 °C $\gamma = 0.9992$
 Flow Rate : 50 m³/h
 Delivery Head : 67 m
 Suction Head : 3.5 m

Selected pump EA 50/26 - Required NPSHr at 50 m³/h is = 2 m

For 15 °C water

$h_p = P_a / \gamma = 10.33$ m

$h_{pv} = P_v / \gamma = 0.174$ m (0.01704 bar)

$h_f = 3.5$ m total loss in the suction line
 (1 elbow and 1 check valve)

$h_z = 3.5$ m

if we put this into our formula;

$10.33 + (-3.5) \geq (2 + 0.5) + 3.4 + 0.174$
 then

$6.83 > 6$ m

The result is:

pump can perform suction.

DESCRIPTION

γ = Specific weight of the liquid 15 °C = 0.9992 = 1
 (from evaporation pressure table)

P_a = Atmospheric pressure = barometric pressure =
 1013hPa = 1.013 bar (directly from meteorology)
 1 bar = 10.2 m
 1.013 x 10.2 = 10.33 m

h_{pv} = 15 °C $P_v = 0.01704$ bar (from evaporation
 pressure table) 0.01704 bar x 10.2 m

$0.1738 / 0.9992 = 0.174$ m

h_z = 3.5 m suction head

h_f = (suction pipe $\varnothing 65$ 3.5 m pipe + 90° wide elbow +
 check valve) flow resistances

From flat pipe flow resistance and armature loss table:

For 50 m³/h $\varnothing 65$ pipe, 100 m pipe loss is not given
 in the table, but based on interpolation calculation
 method;

On the table, for 48 m³/h, the loss is $h_r = 42$ m

On the table, for 54 m³/h, the loss is $h_r = 52$ m

For $54 - 48 = 6$ m³, the loss is $52 - 42 = 10$ m

For $10/6 = 1.66$ x 2 m³, the loss is $h_r = 2 \times 1.66 = 3.32$ m

For 50 m³/h, the loss is $h_r = 42 + 3.32 = 45.3$
 (for 100 m pipe)

For 1 m pipe, the loss is $45 / 100 = 0.453$ m

$\varnothing 65$ 3.5 m pipe loss = $3.5 \times 0.453 = 1.59$ m

$\varnothing 65$ 90° wide elbow = $0.9 \times 0.453 = 0.4$ m

$\varnothing 65$ Check valve = $3 \times 0.453 = 1.4$ m

$h_f = 1.59 + 0.4 + 1.4 = 3.4$ m

FRICTION LOSS IN 100 M STRAIGHT PIPE **CAST IRON PIPE (HAZEN-WILLIAMS FORMULA C=100)**

FLOW RATE		NOMINAL DIAMETER as mm and inch																	
m ³ /h	l/min		15 1/2"	20 3/4"	25 1"	32 1 1/4"	40 1 1/2"	50 2"	65 2 1/2"	80 3"	100 4"	125 5"	150 6"	175 7"	200 8"	250 10"	300 12"	350 14"	400 16"
0.6	10	v h	0.94 16	0.53 3.94	0.34 1.33	0.21 0.40	0.13 0.13												
0.9	15	v h	1.42 33.9	0.80 8.35	0.51 2.82	0.31 0.85	0.20 0.29												
1.2	20	v h	1.89 57.7	1.06 14.21	0.68 4.79	0.41 1.44	0.27 0.49	0.17 0.16											
1.5	25	v h	2.36 87.2	1.33 21.5	0.85 7.24	0.52 2.18	0.33 0.73	0.21 0.25											
1.8	30	v h	2.83 122	1.59 30.1	1.02 10.1	0.62 3.05	0.40 1.03	0.25 0.35											
2.1	35	v h	3.30 162	1.86 40.0	1.19 13.5	0.73 4.06	0.46 1.37	0.30 0.46											
2.4	40	v h		2.12 51.2	1.36 17.3	0.83 5.19	0.53 1.75	0.34 0.59	0.20 0.16										
3	50	v h		2.65 77.4	1.70 26.1	1.04 7.85	0.66 2.65	0.42 0.89	0.25 0.25										
3.6	60	v h		3.18 108	2.04 36.6	1.24 11.0	0.80 3.71	0.51 1.25	0.30 0.35										
4.2	70	v h		3.72 144	2.38 48.7	1.45 14.6	0.93 4.93	0.59 1.66	0.35 0.46										
4.8	80	v h		4.25 185	2.72 62.3	1.66 18.7	1.06 6.32	0.68 2.13	0.40 0.59										
5.4	90	v h			3.06 77.5	1.87 23.3	1.19 7.85	0.76 2.65	0.45 0.74	0.30 0.27									
6	100	v h			3.40 94.1	2.07 28.3	1.33 9.54	0.85 3.22	0.50 0.90	0.33 0.33									
7.5	125	v h			4.25 142	2.59 42.8	1.66 14.4	1.06 4.86	0.63 1.36	0.41 0.49									
9	150	v h				3.11 59.9	1.99 20.2	1.27 6.82	0.75 1.90	0.50 0.69	0.32 0.23								
10.5	175	v h				3.63 79.7	2.32 26.9	1.49 9.07	0.88 2.53	0.58 0.92	0.37 0.31								
12	200	v h				4.15 102	2.65 34.4	1.70 11.6	1.01 3.23	0.66 1.18	0.42 0.40								
15	250	v h				5.18 154	3.32 52.0	2.12 17.5	1.26 4.89	0.83 1.78	0.53 0.60	0.34 0.20							
18	300	v h					3.98 72.8	2.55 24.6	1.51 6.85	1.00 2.49	0.64 0.84	0.41 0.28							
24	400	v h					5.31 124	3.40 41.8	2.01 11.66	1.33 4.24	0.85 1.43	0.54 0.48	0.38 0.20						
30	500	v h					6.63 187	4.25 63.2	2.51 17.6	1.66 6.41	1.06 2.16	0.68 0.73	0.47 0.30						
36	600	v h						5.10 88.6	3.02 24.7	1.99 8.98	1.27 3.03	0.82 1.02	0.57 0.42	0.42 0.20					
42	700	v h						5.94 118	3.52 32.8	2.32 11.9	1.49 4.03	0.95 1.36	0.66 0.56	0.49 0.26					
48	800	v h						6.79 151	4.02 42.0	2.65 15.3	1.70 5.16	1.09 1.74	0.75 0.72	0.55 0.34					
54	900	v h						7.64 188	4.52 52.3	2.99 19.0	1.91 6.41	1.22 2.16	0.85 0.89	0.62 0.42					
60	1000	v h							5.03 63.5	3.32 23.1	2.12 7.79	1.36 2.63	0.94 1.08	0.69 0.51	0.53 0.27				
75	1250	v h							6.28 96.0	4.15 34.9	2.65 11.8	1.70 3.97	1.18 1.63	0.87 0.77	0.66 0.40				
90	1500	v h							7.54 134	4.98 48.9	3.18 16.5	2.04 5.57	1.42 2.29	1.04 1.08	0.80 0.56				
105	1750	v h							8.79 179	5.81 65.1	3.72 21.9	2.38 7.40	1.65 3.05	1.21 1.44	0.93 0.75				
120	2000	v h							6.63 83.3	4.25 28.1	2.72 9.48	1.89 3.90	1.39 1.84	1.06 0.96	0.68 0.32				
150	2500	v h							8.29 126	5.31 42.5	3.40 14.3	2.36 5.89	1.73 2.78	1.33 1.45	0.85 0.49				
180	3000	v h								6.37 59.5	4.08 20.1	2.83 8.26	2.08 3.90	1.59 2.03	1.02 0.69	0.71 0.28			
210	3500	v h								7.43 79.1	4.76 26.7	3.30 11.0	2.43 5.18	1.86 2.71	1.19 0.91	0.83 0.38			
240	4000	v h								8.49 101	5.44 34.2	3.77 14.1	2.77 6.64	2.12 3.46	1.36 1.17	0.94 0.48			
300	5000	v h									6.79 51.6	4.72 21.2	3.47 10.0	2.65 5.23	1.70 1.77	1.18 0.73			
360	6000	v h									8.15 72.3	5.66 29.8	4.16 14.1	3.18 7.33	2.04 2.47	1.42 1.02			
420	7000	v h										6.61 39.6	4.85 18.7	3.72 9.75	2.38 3.29	1.65 1.35	1.21 0.64		
480	8000	v h										7.55 50.7	5.55 23.9	4.25 12.49	2.72 4.21	1.89 1.73	1.39 0.82		
540	9000	v h										8.49 63.0	6.24 29.8	4.78 15.5	3.06 5.24	2.12 2.16	1.56 1.02	1.19 0.53	
600	10000	v h											6.93 36.2	5.31 18.9	3.40 6.36	2.36 2.62	1.73 1.24	1.33 0.65	

FRICTION LOSS

TABLE FOR THE FLOW RESISTANCES IN ELBOWS, CHECK VALVES AND VALVES

Flow resistance is calculated based on the following table using the equivalent pipe length method.

ACCESSORY TYPE	DN											
	25	32	40	50	65	80	100	125	150	200	250	300
	E value pipe length (m)											
45° Elbow	0.2	0.2	0.4	0.4	0.6	0.6	0.9	1.1	1.5	1.9	2.4	2.8
90° Elbow	0.4	0.6	0.9	1.1	1.3	1.5	2.1	2.6	3.0	3.9	4.7	5.8
90° Wide Elbow	0.4	0.4	0.4	0.6	0.9	1.1	1.3	1.7	1.9	2.8	3.4	3.9
Sleeve T or Cross-Piece	1.1	1.3	1.7	2.1	2.6	3.2	4.3	5.3	6.4	7.5	10.7	12.8
Valve	-	-	-	0.2	0.2	0.2	0.4	0.4	0.6	0.9	1.1	1.3
Check Valve	1.1	1.5	1.9	2.4	3.0	3.4	4.7	5.9	7.4	9.6	11.8	13.9

- The table is for Hazen Williams coefficient, and C equals to 100 (cast iron pipe installation)
- The coefficient for steel pipe installations is 1.41
- The coefficient for stainless steel, copper pipe and galvanized cast iron pipe installations is 1.85
- When an equivalent pipe length is identified, the friction resistance is obtained from the flow resistance table.
- The given values are approximate values for models and especially for valves and check valves, and should be compared with the values provided by the manufacturer.

EVAPORATION PRESSURE Pv and Y SPECIFIC WEIGHT OF WATER

t	T	Pv	Y
°C	K	bar	kg/dm ³
0	273.15	0.00611	0.9998
1	274.15	0.00657	0.9999
2	275.15	0.00706	0.9999
3	276.15	0.00758	0.9999
4	277.15	0.00813	1.0000
5	278.15	0.00872	1.0000
6	279.15	0.00935	1.0000
7	280.15	0.01001	0.9999
8	281.15	0.01072	0.9999
9	282.15	0.01147	0.9998
10	283.15	0.01227	0.9997
11	284.15	0.01312	0.9997
12	285.15	0.01401	0.9996
13	286.15	0.01497	0.9994
14	287.15	0.01597	0.9993
15	288.15	0.01704	0.9992
16	289.15	0.01817	0.9990
17	290.15	0.01936	0.9988
18	291.15	0.02062	0.9987
19	292.15	0.02196	0.9985
20	293.15	0.02337	0.9983
21	294.15	0.024850	0.9981
22	295.15	0.02642	0.9978
23	296.15	0.02808	0.9976
24	297.15	0.02982	0.9974
25	298.15	0.03166	0.9971
26	299.15	0.03360	0.9968
27	300.15	0.03564	0.9966
28	301.15	0.03778	0.9963
29	302.15	0.04004	0.9960
30	303.15	0.04241	0.9957
31	304.15	0.04491	0.9954
32	305.15	0.04753	0.9951
33	306.15	0.05029	0.9947
34	307.15	0.05318	0.9944
35	308.15	0.05622	0.9940
36	309.15	0.05940	0.9937
37	310.15	0.06274	0.9933
38	311.15	0.06624	0.9930
39	312.15	0.06991	0.9927
40	313.15	0.07375	0.9923
41	314.15	0.07777	0.9919
42	315.15	0.08198	0.9915
43	316.15	0.08639	0.9911
44	317.15	0.09100	0.9907
45	318.15	0.09582	0.9902
46	319.15	0.10086	0.9898
47	320.15	0.10612	0.9894
48	321.15	0.11162	0.9889
49	322.15	0.11736	0.9884
50	323.15	0.12335	0.9880
51	324.15	0.12961	0.9876
52	325.15	0.13613	0.9871
53	326.15	0.14293	0.9862
54	327.15	0.15002	0.9862

t	T	Pv	Y
°C	K	bar	kg/dm ³
55	328.15	0.15741	0.9857
56	329.15	0.16511	0.9852
57	330.15	0.17313	0.9846
58	331.15	0.18147	0.9842
59	332.15	0.19016	0.9837
60	333.15	0.1992	0.9832
61	334.15	0.2086	0.9826
62	335.15	0.2184	0.9821
63	336.15	0.2286	0.9816
64	337.15	0.2391	0.9811
65	338.15	0.2501	0.9805
66	339.15	0.2615	0.9799
67	340.15	0.2733	0.9793
68	341.15	0.2856	0.9788
69	342.15	0.2984	0.9782
70	343.15	0.3116	0.9777
71	344.15	0.3253	0.9770
72	345.15	0.3396	0.9765
73	346.15	0.3543	0.9760
74	347.15	0.3696	0.9753
75	348.15	0.3855	0.9748
76	349.15	0.4019	0.9741
77	350.15	0.4189	0.9735
78	351.15	0.4365	0.9729
79	352.15	0.4547	0.9723
80	353.15	0.4736	0.9716
81	354.15	0.4931	0.9710
82	355.15	0.5133	0.9704
83	356.15	0.5342	0.9697
84	357.15	0.5557	0.9691
85	358.15	0.5780	0.9684
86	359.15	0.6011	0.9678
87	360.15	0.6249	0.9671
88	361.15	0.6495	0.9665
89	362.15	0.6749	0.9658
90	363.15	0.7011	0.9652
91	364.15	0.7281	0.9644
92	365.15	0.7561	0.9638
93	366.15	0.7849	0.9630
94	367.15	0.8146	0.9624
95	368.15	0.8453	0.9616
96	369.15	0.8769	0.9610
97	370.15	0.9094	0.9602
98	371.15	0.9430	0.9596
99	372.15	0.9776	0.9586
100	373.15	1.0133	0.9581
102	375.15	1.0878	0.9567
104	377.15	1.1668	0.9552
106	379.15	1.2504	0.9537
108	381.15	1.3390	0.9522
110	383.15	1.4327	0.9507
112	385.15	1.5316	0.9491
114	387.15	1.6362	0.9476
116	389.15	1.7465	0.9460
118	391.15	1.8628	0.9445

t	T	Pv	Y
°C	K	bar	kg/dm ³
120	393.15	1.9854	0.9429
122	395.15	2.1145	0.9412
124	397.15	2.2504	0.9396
126	399.15	2.3933	0.9379
128	401.15	2.5435	0.9362
130	403.15	2.7013	0.9346
132	405.15	2.867	0.9328
134	407.15	3.041	0.9311
136	409.15	3.223	0.9294
138	411.15	3.414	0.9276
140	413.15	3.614	0.9258
145	418.15	4.155	0.9214
155	428.15	5.433	0.9121
160	433.15	6.181	0.9073
165	438.15	7.008	0.9024
170	443.15	7.920	0.8973
175	448.15	8.924	0.8921
180	453.15	10.027	0.8869
185	458.15	11.233	0.8815
190	463.15	12.551	0.8760
195	468.15	13.987	0.8704
200	473.15	15.550	0.8647
205	478.15	17.243	0.8588
210	483.15	19.077	0.8528
215	488.15	21.060	0.8467
220	493.15	23.198	0.8403
225	498.15	25.501	0.8339
230	503.15	27.976	0.8273
235	508.15	30.632	0.8205
240	513.15	33.478	0.8136
245	518.15	36.523	0.8065
250	523.15	39.776	0.7992
255	528.15	43.246	0.7916
260	533.15	46.943	0.7839
265	538.15	50.877	0.7759
270	543.15	55.058	0.7678
275	548.15	59.496	0.7593
280	553.15	64.202	0.7505
285	558.15	69.186	0.7415
290	563.15	74.461	0.7321
295	568.15	80.037	0.7223
300	573.15	85.927	0.7122
305	578.15	92.144	0.7017
310	583.15	98.70	0.6906
315	588.15	105.61	0.6791
320	593.15	112.89	0.6669
325	598.15	120.56	0.6541
330	603.15	128.63	0.6404
340	613.15	146.05	0.6102
350	623.15	165.35	0.5743
360	633.15	186.75	0.5275
370	643.15	210.54	0.4518
374.15	647.30	221.20	0.3154

NOTE

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Dudullu Organize Sanayi Bölgesi 2. Cad. No. 14
34775 Ümraniye - İstanbul / Turkey
Tel. +90 216 561 47 74 (Pbx) • Fax. +90 216 561 47 50
www.etna.com.tr • info@etna.com.tr

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0850 455 38 62
— customer service —