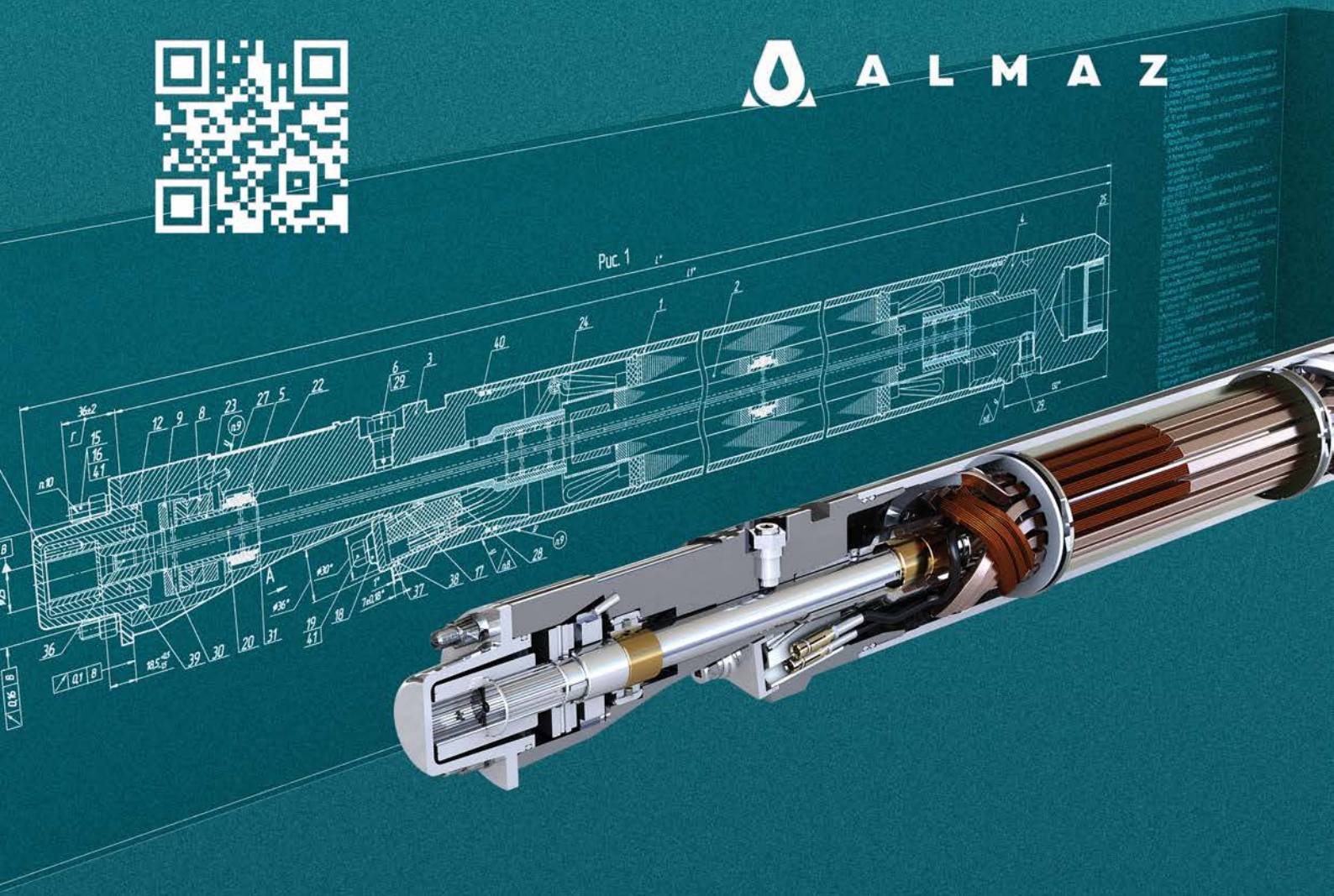
ALMAZ



PRODUCTION AND SERVICE OF SUBMERSIBLE EQUIPMENT

CATALOGUE OF PRODUCTS

CONTENTS

INTRODUCTION

CERTIFICATE


StandCert

issues

Certificate

No. OH-0503

which confirms that
Occupational Health and Safety Management System
of organization

Limited Liability Company
„ALMAZ Production Company“

40/1, Office 17, Shkolnaya Str., Mikroddistrict "Yuzhniy", Raduzhniy, Khanti-Mansi A.D.-Ugra, 628463, Russia

is in compliance with standard
ISO 45001:2018
for the following scope of certification

Design, development, manufacturing and supply of submersible pumps, submersible electric motors, pump modules, gas separators, dispersants, additional modules, products, cable oil wells heating system, winding wires, tubes for supplying reagent to the well, thermomanometric systems, control stations and transformers for electric submersible installations as well as repair, servicing and renting of electric submersible installations and other related services in oil and gas recovery industry

Director
Mirjana Stanić, M.Sc.

ISO 45001:2018

for the following scope of certification

Design, development, manufacturing and supply of submersible pumps, submersible electric motors, pump modules, gas separators, dispersants, additional modules, products, cable oil wells heating system, winding wires, tubes for supplying reagent to the well, thermomanometric systems, control stations and transformers for electric submersible installations as well as repair, servicing and renting of electric submersible installations and other related services in oil and gas recovery industry


StandCert

issues

Certificate

No. QS-1122

which confirms that
Quality Management System
of organization

Limited Liability Company
„ALMAZ Production Company“

40/1, Office 17, Shkolnaya Str., Mikroddistrict "Yuzhniy", Raduzhniy, Khanti-Mansi A.D.-Ugra, 628463, Russia

is in compliance with standard
ISO 9001:2015
for the following scope of certification

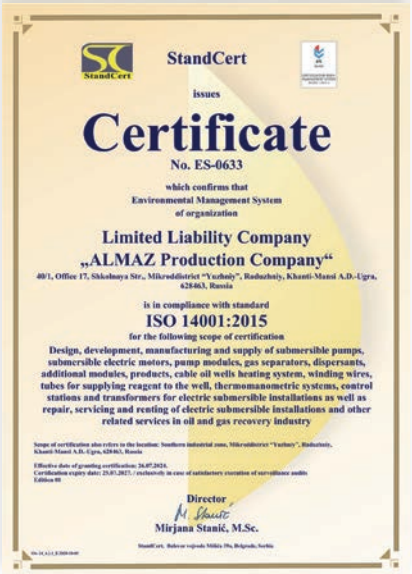
Design, development, manufacturing and supply of submersible pumps, submersible electric motors, pump modules, gas separators, dispersants, additional modules, products, cable oil wells heating system, winding wires, tubes for supplying reagent to the well, thermomanometric systems, control stations and transformers for electric submersible installations as well as repair, servicing and renting of electric submersible installations and other related services in oil and gas recovery industry

Director
Mirjana Stanić, M.Sc.

ISO 9001:2015

for the following scope of certification

Design, development, manufacturing and supply of submersible pumps, submersible electric motors, pump modules, gas separators, dispersants, additional modules, products, cable oil wells heating system, winding wires, tubes for supplying reagent to the well, thermomanometric systems, control stations and transformers for electric submersible installations as well as repair, servicing and renting of electric submersible installations and other related services in oil and gas recovery industry


StandCert

issues

Certificate

No. ES-0633

which confirms that
Environmental Management System
of organization

Limited Liability Company
„ALMAZ Production Company“

40/1, Office 17, Shkolnaya Str., Mikroddistrict "Yuzhniy", Raduzhniy, Khanti-Mansi A.D.-Ugra, 628463, Russia

is in compliance with standard
ISO 14001:2015
for the following scope of certification

Design, development, manufacturing and supply of submersible pumps, submersible electric motors, pump modules, gas separators, dispersants, additional modules, products, cable oil wells heating system, winding wires, tubes for supplying reagent to the well, thermomanometric systems, control stations and transformers for electric submersible installations as well as repair, servicing and renting of electric submersible installations and other related services in oil and gas recovery industry

Director
Mirjana Stanić, M.Sc.

ISO 14001:2015

for the following scope of certification

Design, development, manufacturing and supply of submersible pumps, submersible electric motors, pump modules, gas separators, dispersants, additional modules, products, cable oil wells heating system, winding wires, tubes for supplying reagent to the well, thermomanometric systems, control stations and transformers for electric submersible installations as well as repair, servicing and renting of electric submersible installations and other related services in oil and gas recovery industry

INTRODUCTION

ALMAZ Production Company

It has been supplying its own ptoducts to the oil and gas industry markets for more than 30 years, product range amounts to hundreds of items.
Plants posess founding, plating, machining, tool, assembly, maintenance and cable production workshops.
They are equipped with laboratories and testing floors.

Major components of downhole ESP systems manufactured by Manufacturer ALMAZ Production Company include:

- Electric submersible pumps
- Valve
- Intakes, gas and solids handling devices
- Solids handling devices
- Motor protectors
- Electric motors
- Downhole monitoring system
- Downhole cable and motor lead extension

QUALITY CONTROL

ALMAZ Production Company performs all its activities with high quality standards. For this purpose we comply strictly to international standards such us: ISO 9001.
The durability and service life of ALMAZ Production Company ESP system relies on the quality of each system compound.

Quality of the manufactured production is provided owing to:
- Reliability of used components;
- Constancy and improvement of quality control.
- Conduction of system integration testing prior to field installation

ELECTRIC SUBMERSIBLE PUMPS

Conventional pump

Electric submersible pumps and their individual units are designed to operate as part of an installation for pumping formation fluid from oil wells.

Separate versions of Electric submersible pumps can be supplied as booster pumps, or pumps for HPS systems.

ESP parameters
The pumps can be supplied:

- by series: 362, 406, 449
- by appointment: conventional, booster or for HPS;
- by productivity from 115 bls / day to 9400 bls / day;
- by head: up to 11750 ft;
- length of the sections (m): 2; 3; 3.5; 4; 4.5; 5; 5.5; 6;
- according to the design of the stage - single-bearing, single-bearing with an extended hub or double-bearing, open type;
- by type of as ESP motor bly: floaters, ESP motor-compression, compression;
- by the temperature of the formation fluid: ordinary 110°C, heat-resistant 135°C, or extra-heat-resistant temperature versions 170°C;
- in terms of wear resistance (material of steps): can be completed with steps (working bodies) made of cast iron, type I nirisist, type IV nirisist, powder pseudo-alloys, high-alloy powder alloy, stainless steels and other alternative materials at the request of the customer;
- in terms of corrosion resistance: conventional or corrosion-resistant (K) execution;
- by the type of splined shaft design - straight-sided or involute connection;
- by connection: with six-, eight- and ten-point execution (thread pitch may vary from the customer's request);
- by the type of connection: body-flange or flange-flange.

The produced pumps are unified as much as possible, therefore they are easily serviced at any ESP service centers.

ELECTRIC SUBMERSIBLE PUMPS

Conventional pump

EXAMPLE

Az ESP 406-1890 5M 84STG P UT S9 TT2 CR1 NBR

Az	ESP	406	1890			5M	84STG	P	UT	S9	TT2	CR1	NBR
1	2	3	4	5	6	7	8	9	10	11	12	13	14

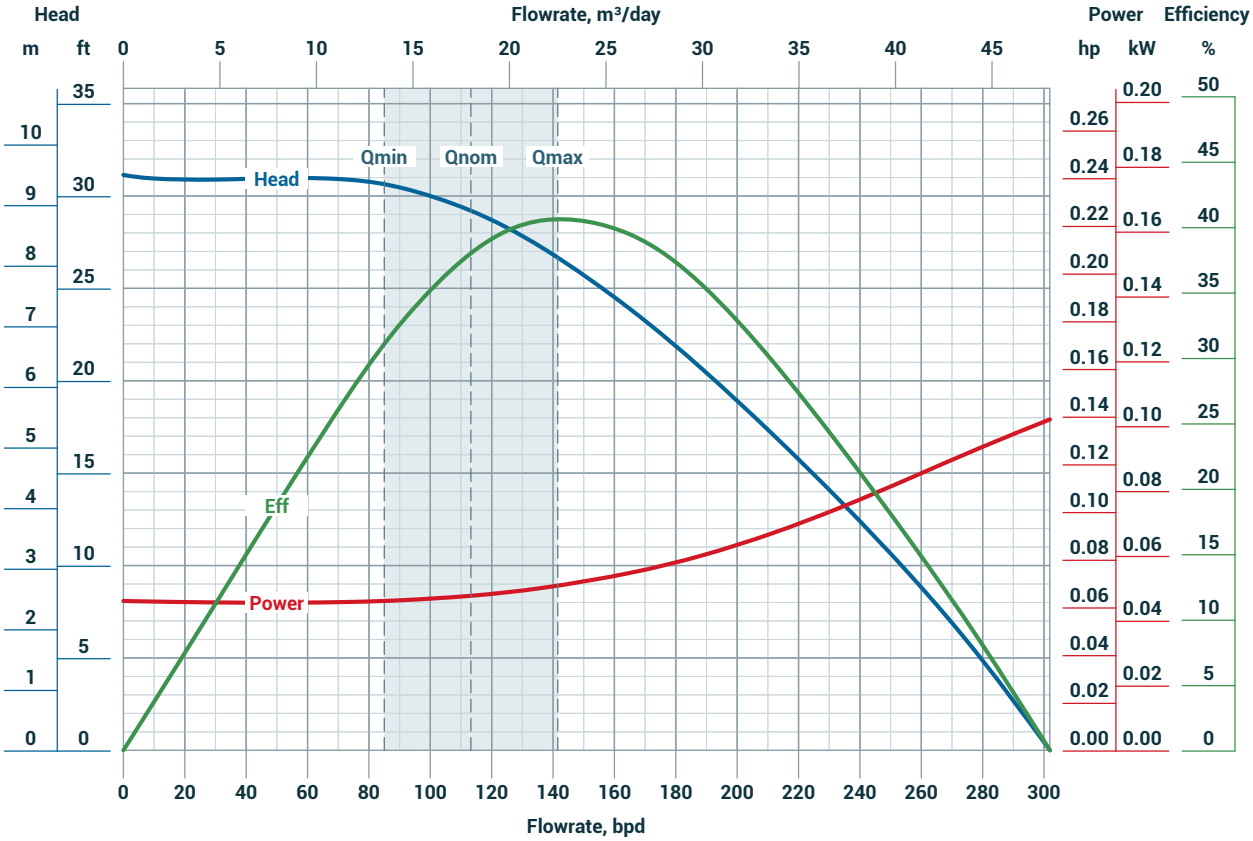
1	Manufacturer ALMAZ Production Company
2	Electric Submersible Pump (ESP)
3	ESP series
4	Pump flow rate (bpd) @ 60 Hz
5	Stage material: No code – Ni-Resist N4 – Ni-Resist type 4
6	Rotation direction: No code – clockwise CCW – counter-clockwise
7	Housing length, m
8	Number of stages
9	Pump design: C – compression F – floater P – packet
10	Pump configuration: UT – upper tandem CT – central tandem LT – lower tandem
11	Shaft material: Stainless steel S9 - Stainless steel (882 MPa) S10 - Stainless steel (980 MPa) S11 - Stainless steel (1080 MPa) INCONEL 718 I8 - Inconel alloy (785 MPa) I10 - Inconel alloy (980 MPa) I12 - Inconel alloy (1180 MPa) MONEL K-500 M8 - Monel alloy (785 Mpa)
12	Bearings Material: TT1 – tungsten carbide sleeve and bearing every 1 meter TT2 – tungsten carbide sleeve and bearing every 0.5 meters TT3 – tungsten carbide sleeve and bearing every 0.35 meters
13	Corrosion resistance design: CR0 – carbon steel head, base and housing, carbon steel fasteners CR1 – stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating),monel fasteners CR2 – stainless steel head, base and housing, monel fasteners
14	Elastomers material: NBR – Nitrile butadiene rubber HNBR – Hydrogenated nitrile butadiene rubber

362 SERIES PUMPS

Az ESP 362 - 115

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

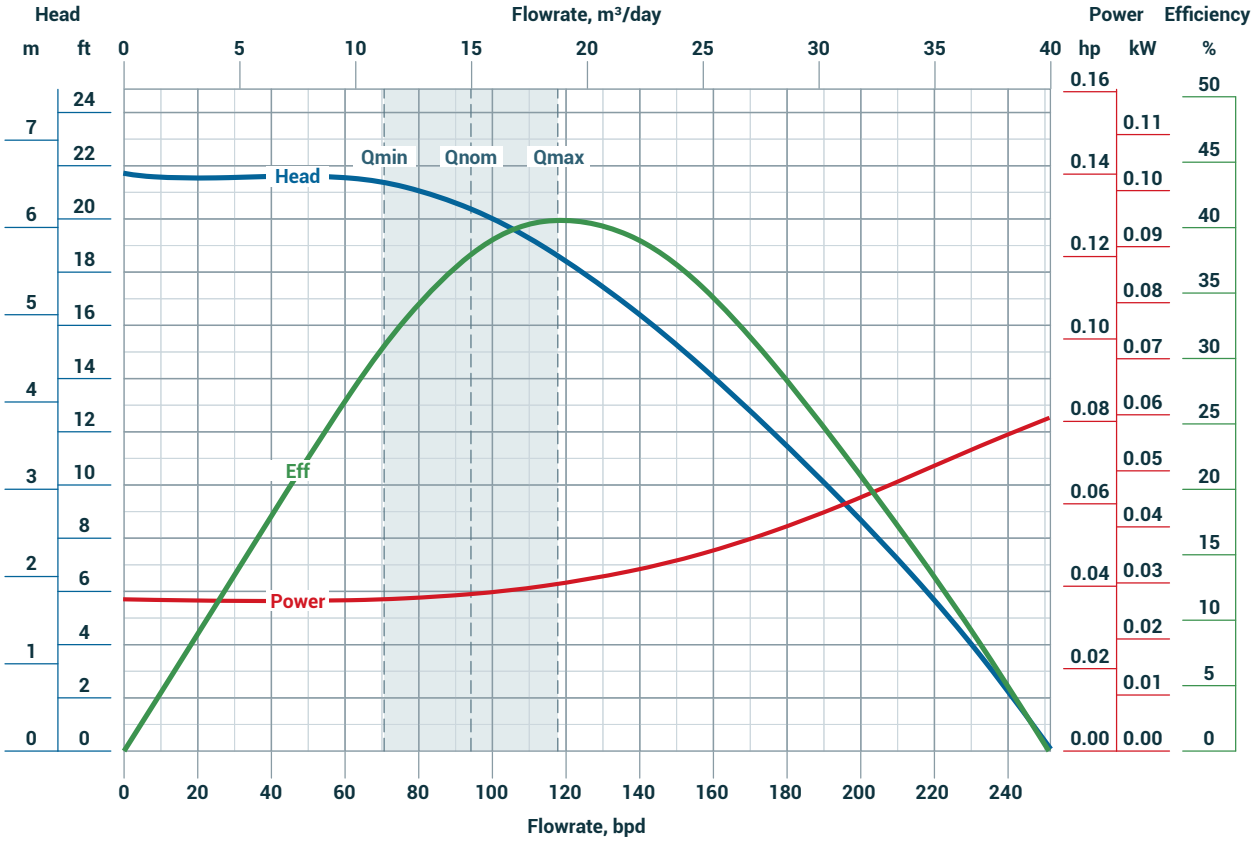
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	117,5 hp	86,4 kW
Recommended Operating Range	86-144 bpd	13,67-22,9 m³/day		High Strength (S10)	132,2 hp	97,2 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	147 hp	108 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 115

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	98 hp	72 kW
Recommended Operating Range	70,76-117,93 bpd	11,25-18,75 m³/day		High Strength (S10)	110,1 hp	81 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	122,4 hp	90 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

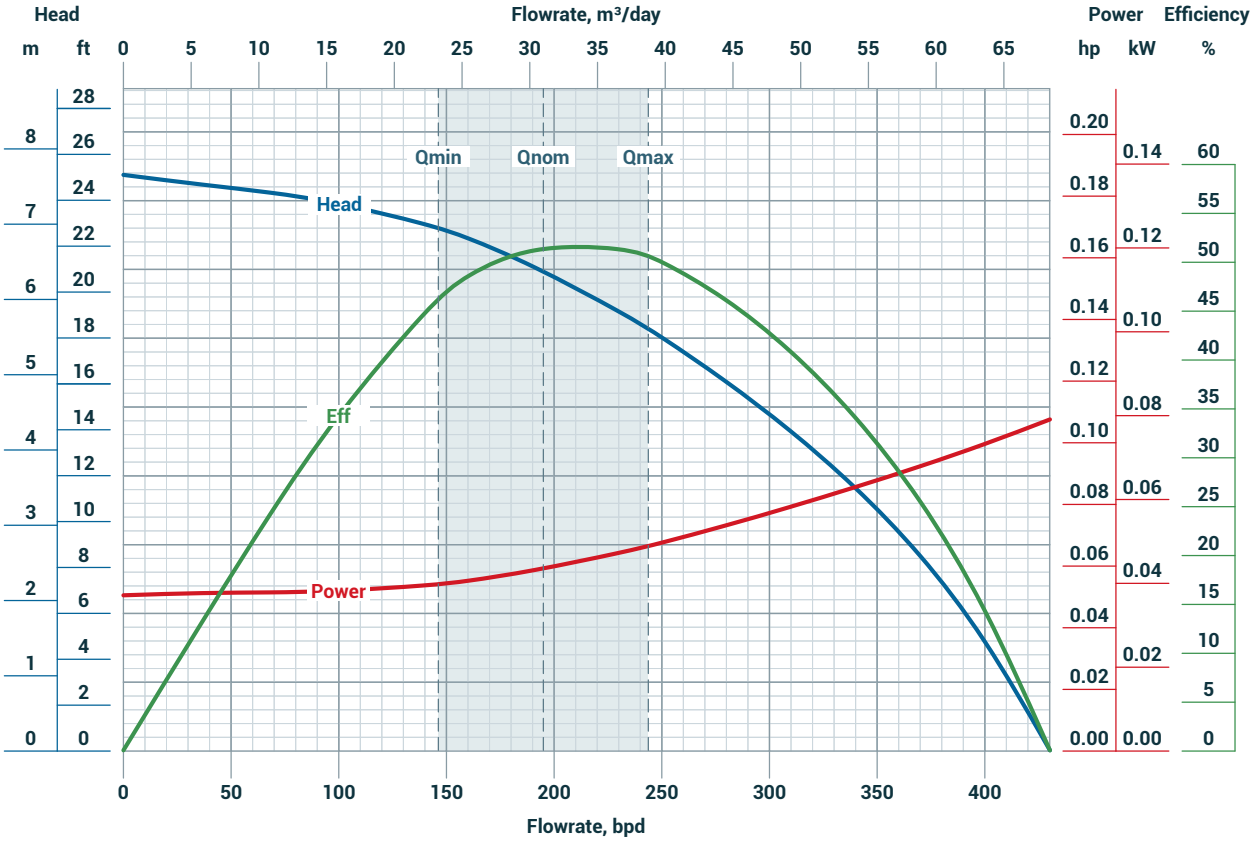
CONTENTS

362 SERIES PUMPS

Az ESP 362 - 200

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

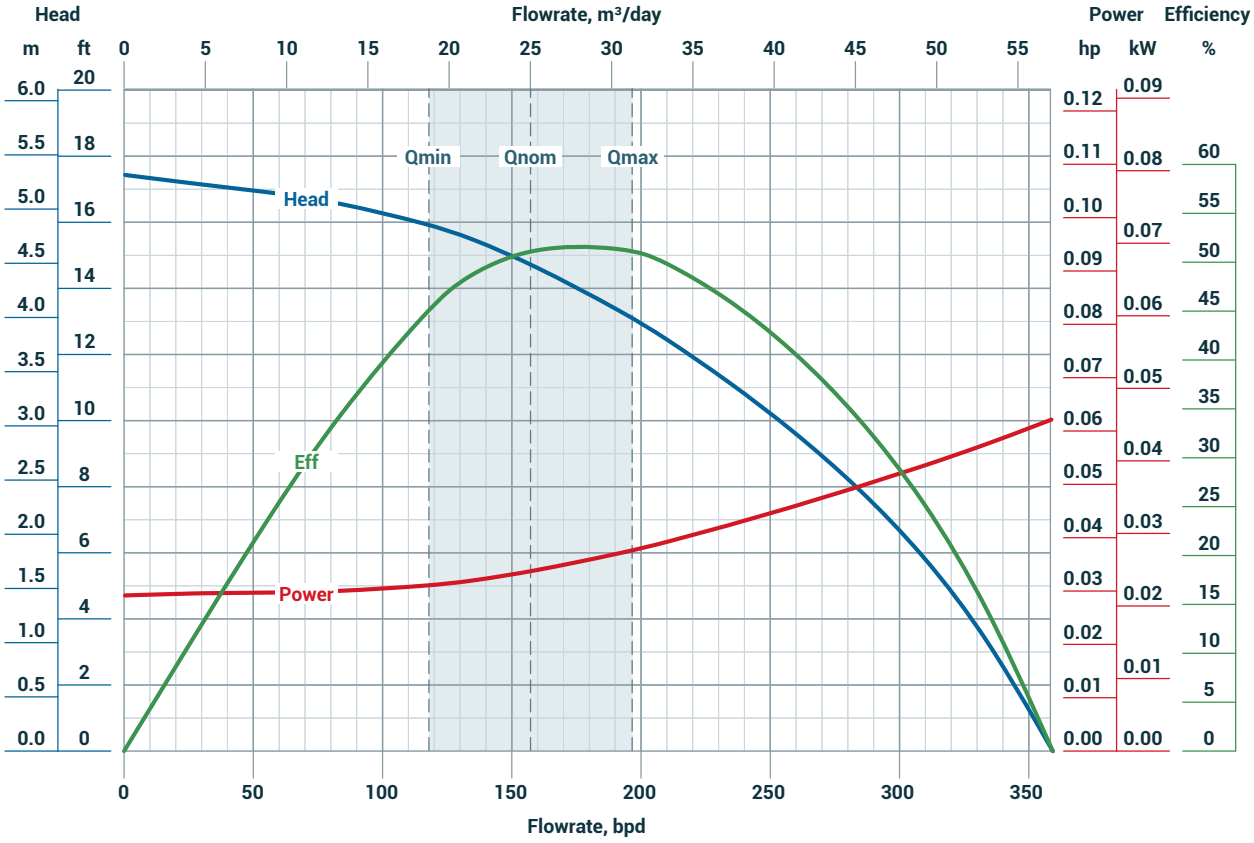
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	117,5 hp	86,4 kW
Recommended Operating Range	150-250 bpd	23,85-39,75 m³/day		High Strength (S10)	132,2 hp	97,2 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	147 hp	108 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 200

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

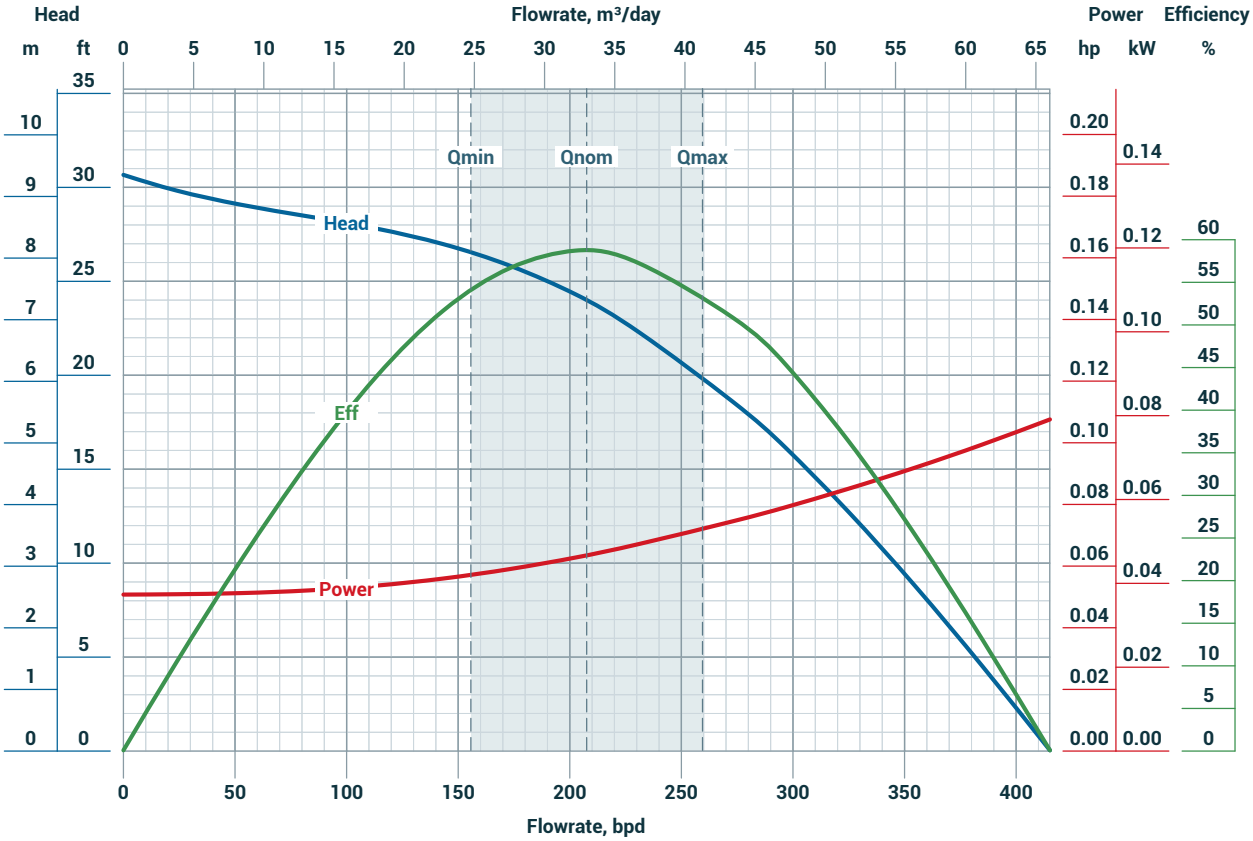
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	98 hp	72 kW
Recommended Operating Range	117,93-196,56 bpd	18,75-31,25 m³/day		High Strength (S10)	110,1 hp	81 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	122,4 hp	90 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 210

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

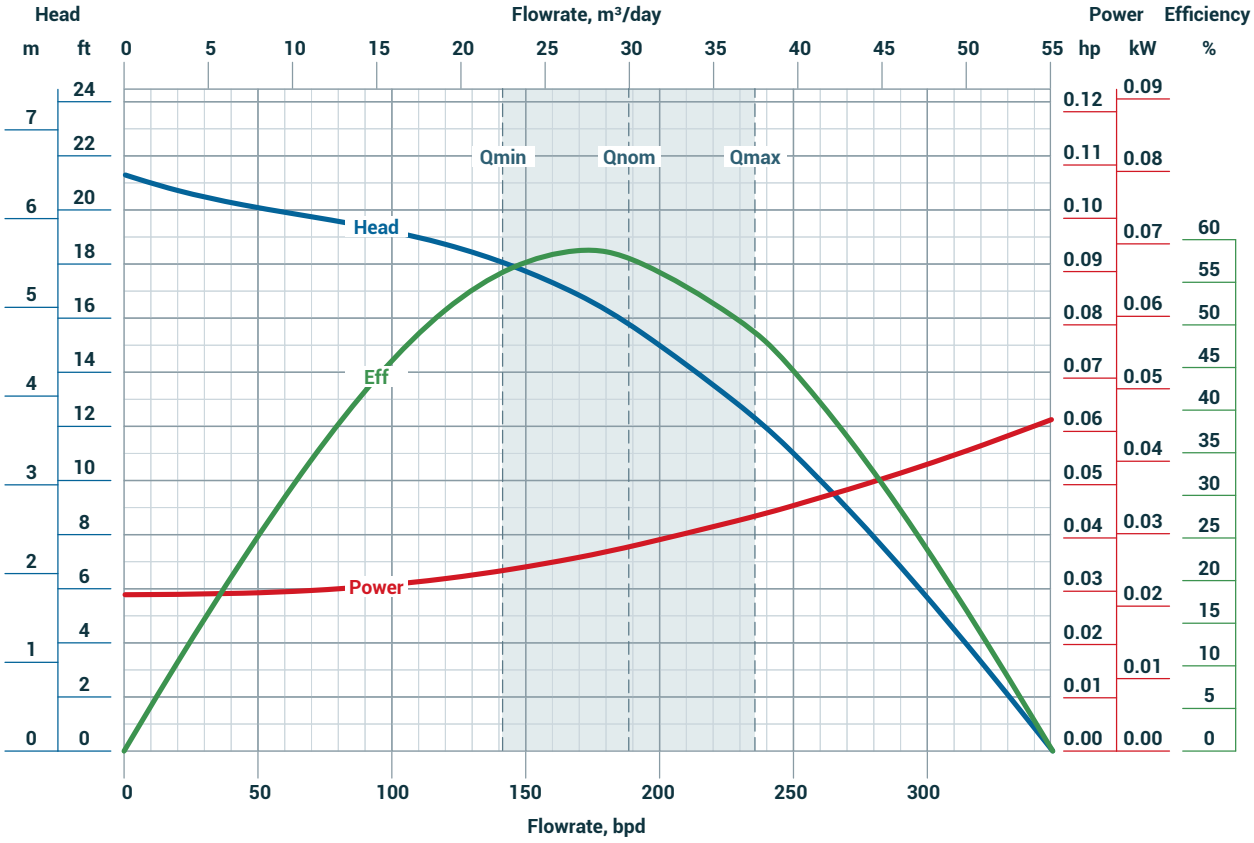
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	117,5 hp	86,4 kW
Recommended Operating Range	157-263 bpd	24,96-42,81 m³/day		High Strength (S10)	132,2 hp	97,2 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	147 hp	108 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 210

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

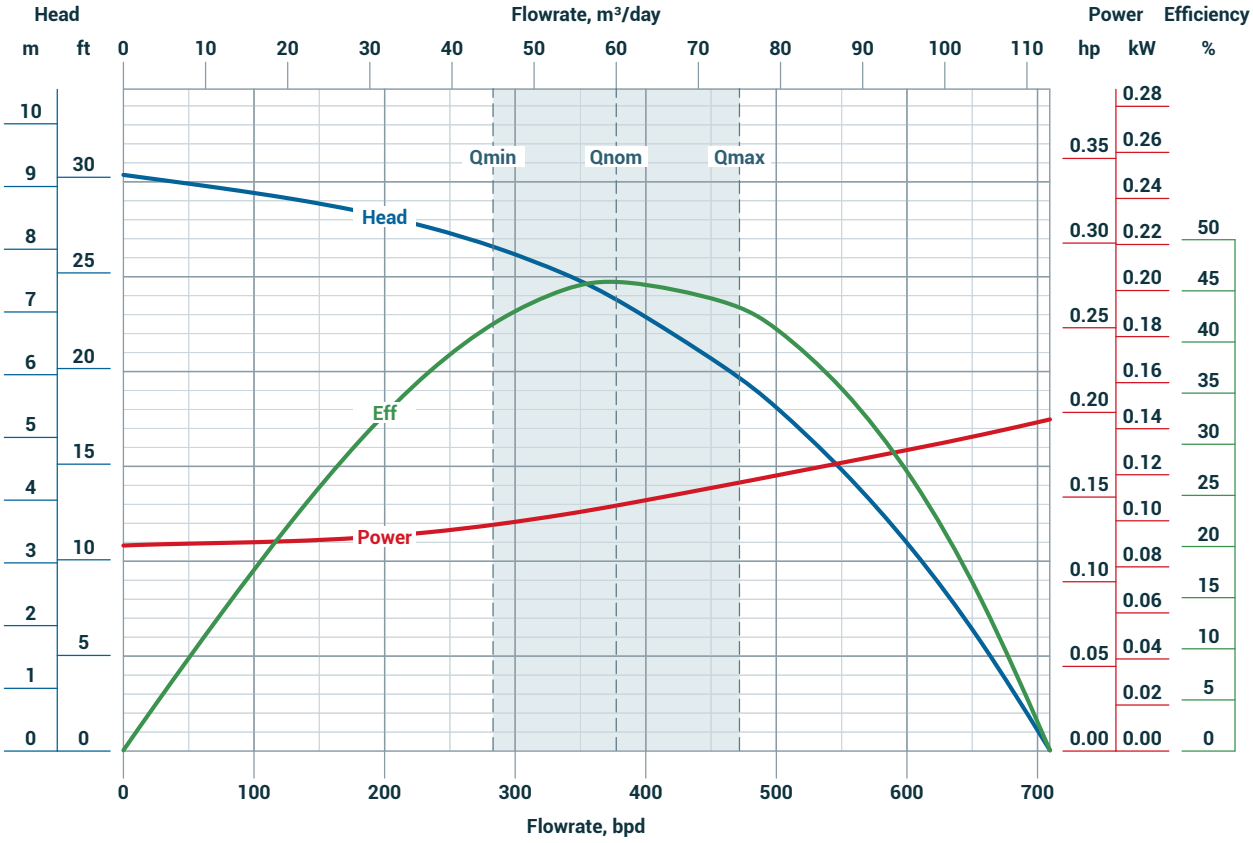
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	98 hp	72 kW
Recommended Operating Range	141,52- 235,87 bpd	22,5-37,5 m³/day		High Strength (S10)	110,1 hp	81 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	122,4 hp	90 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 380

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

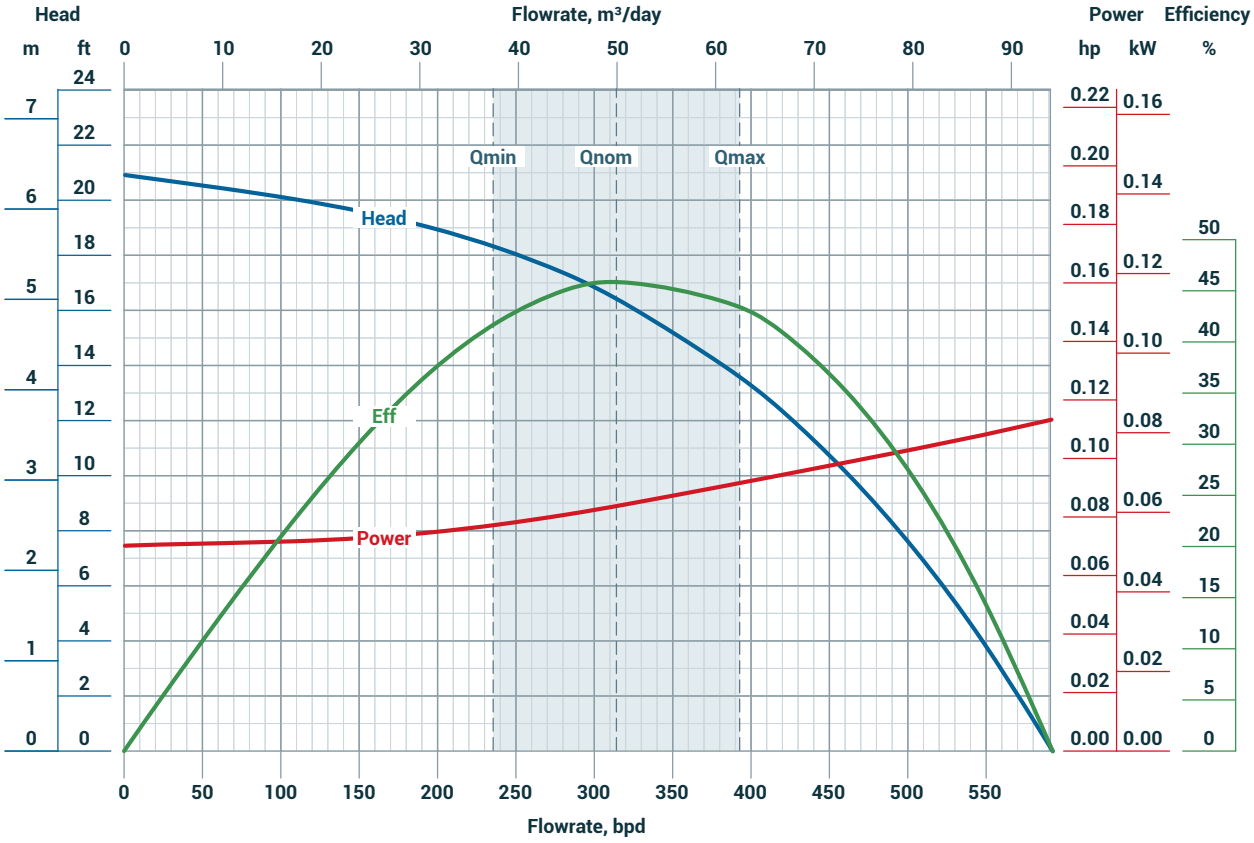
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	117,5 hp	86,4 kW
Recommended Operating Range	285-475 bpd	45,31-75,52 m³/day		High Strength (S10)	132,2 hp	97,2 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	147 hp	108 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 380

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

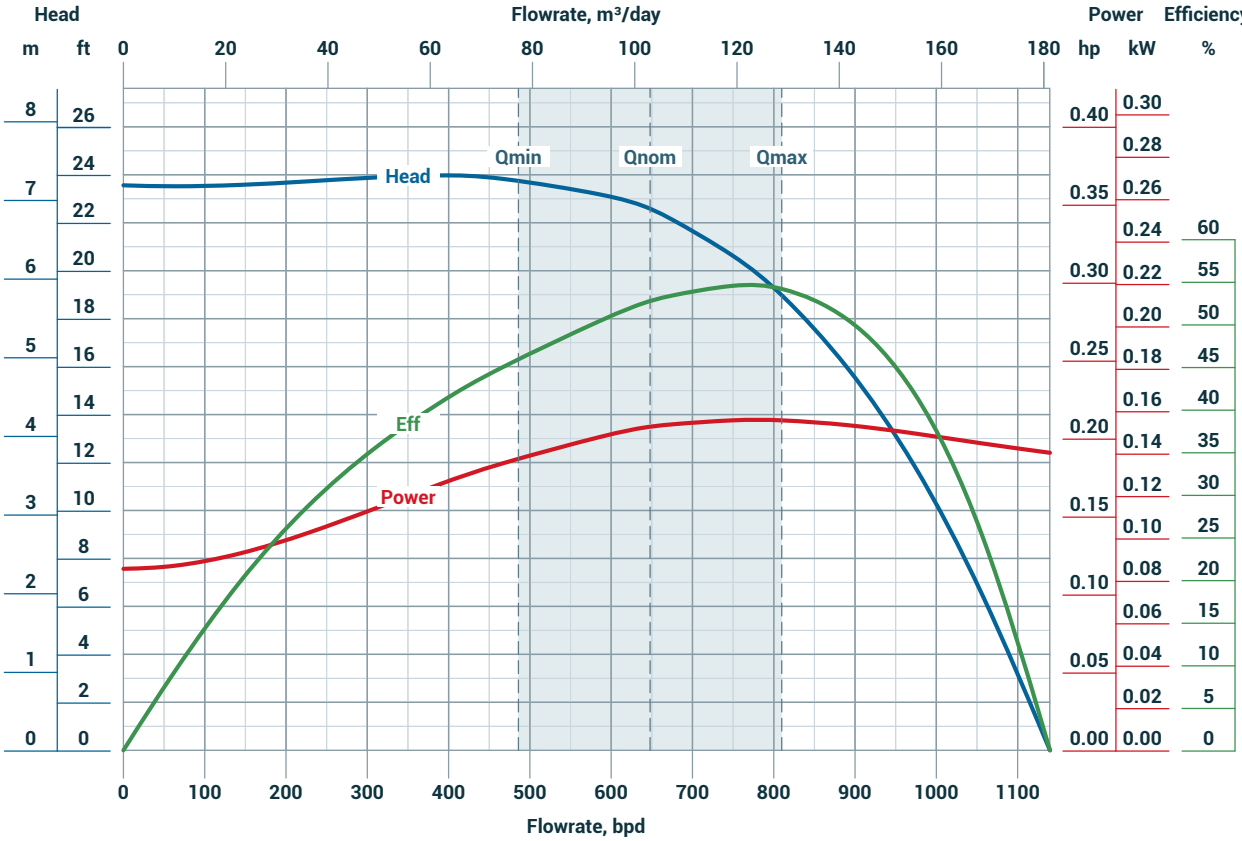
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	98 hp	72 kW
Recommended Operating Range	235,87- 393,11 bpd	37,5-62,5 m³/day		High Strength (S10)	110,1 hp	81 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	122,4 hp	90 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 650

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

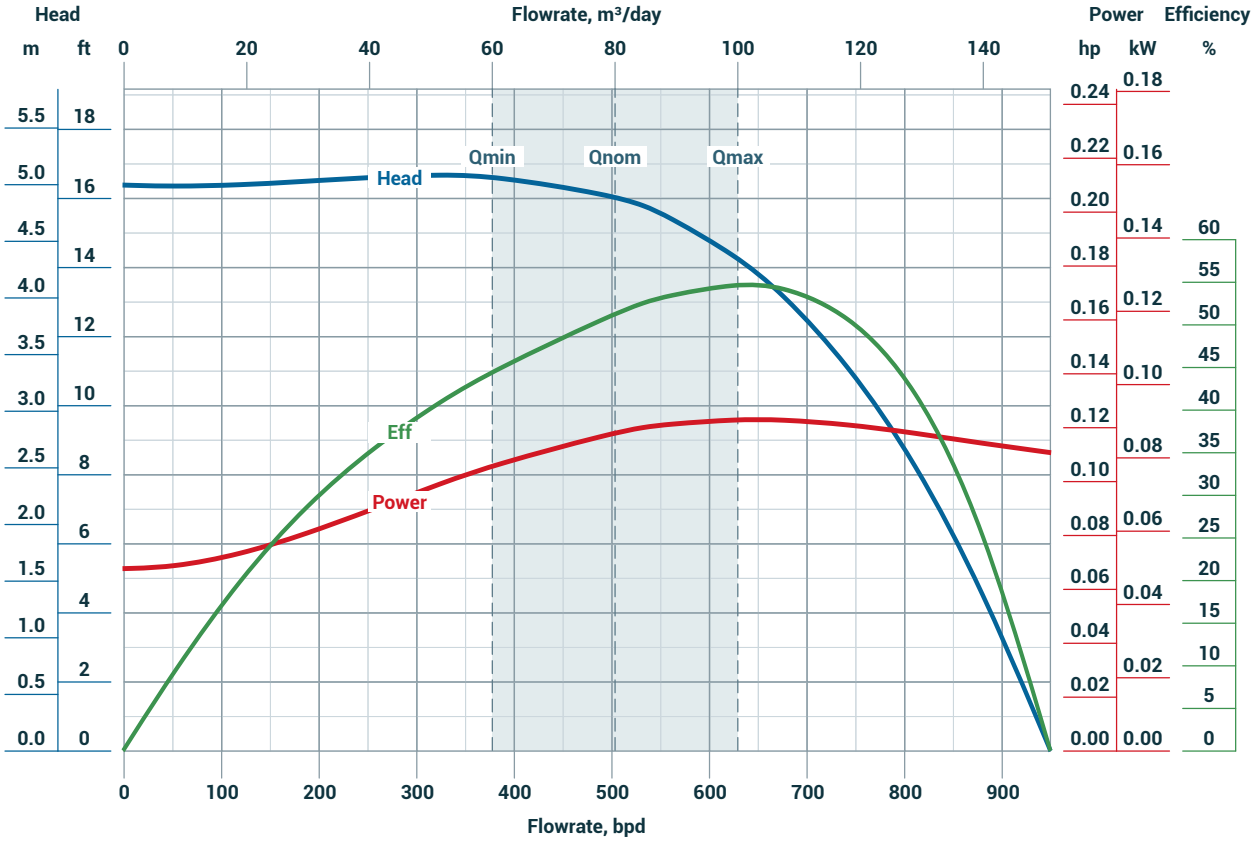
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	117,5 hp	86,4 kW
Recommended Operating Range	487-813 bpd	77,43-129,25 m³/day		High Strength (S10)	132,2 hp	97,2 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	147 hp	108 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 650

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

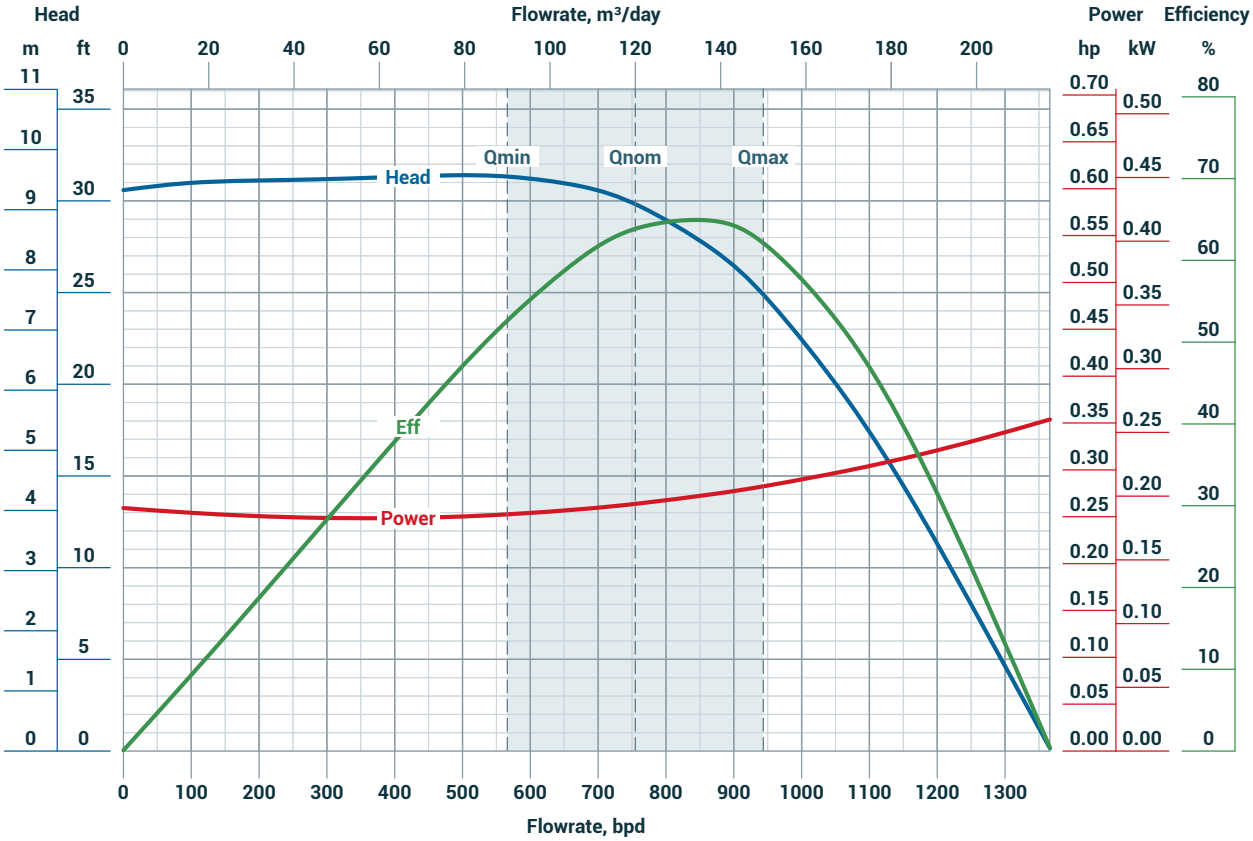
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	98 hp	72 kW
Recommended Operating Range	377,39-628,98 bpd	60-100 m³/day		High Strength (S10)	110,1 hp	81 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	122,4 hp	90 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 760

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

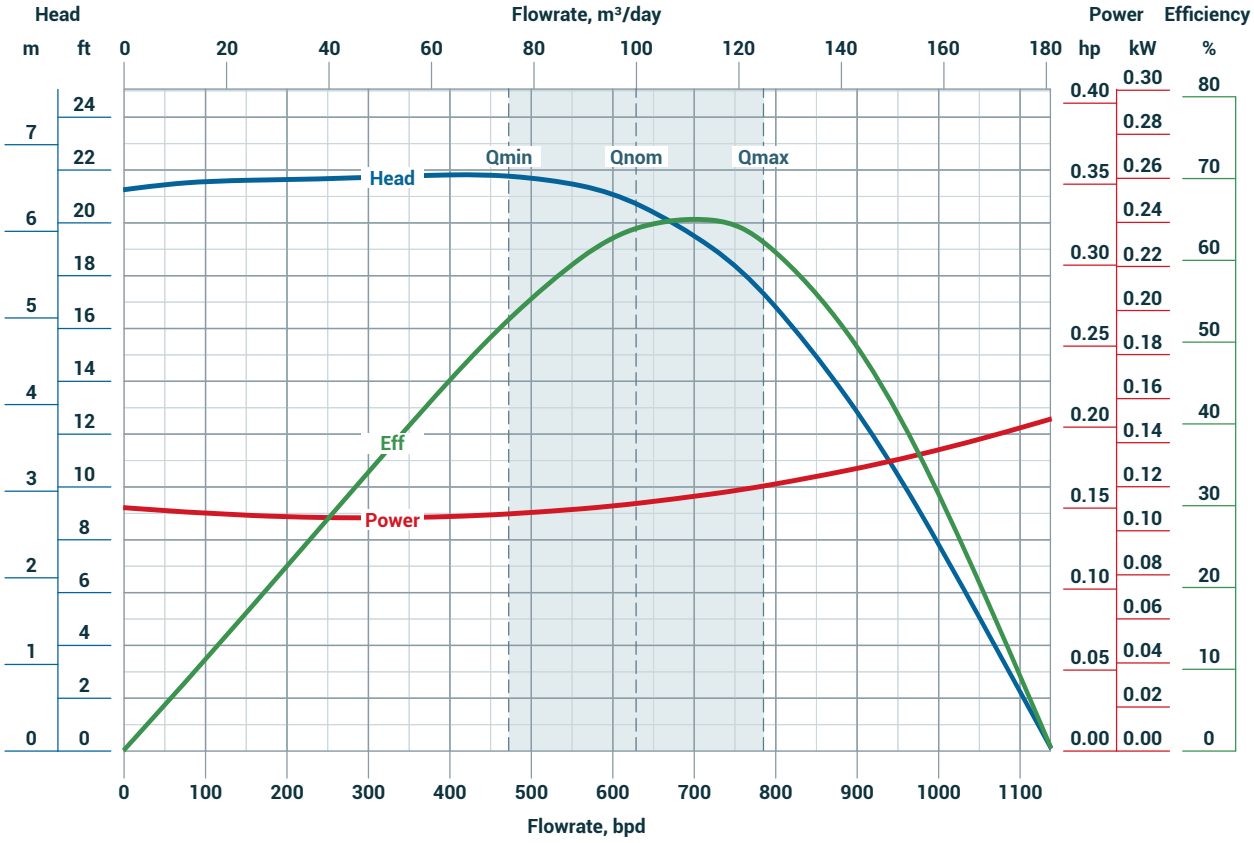
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	117,5 hp	86,4 kW
Recommended Operating Range	570-950 bpd	90,62-151,04 m³/day		High Strength (S10)	132,2 hp	97,2 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	147 hp	108 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 760

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	98 hp	72 kW
Recommended Operating Range	471,7-786,2 bpd	75-125 m³/day		High Strength (S10)	110,1 hp	81 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	122,4 hp	90 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

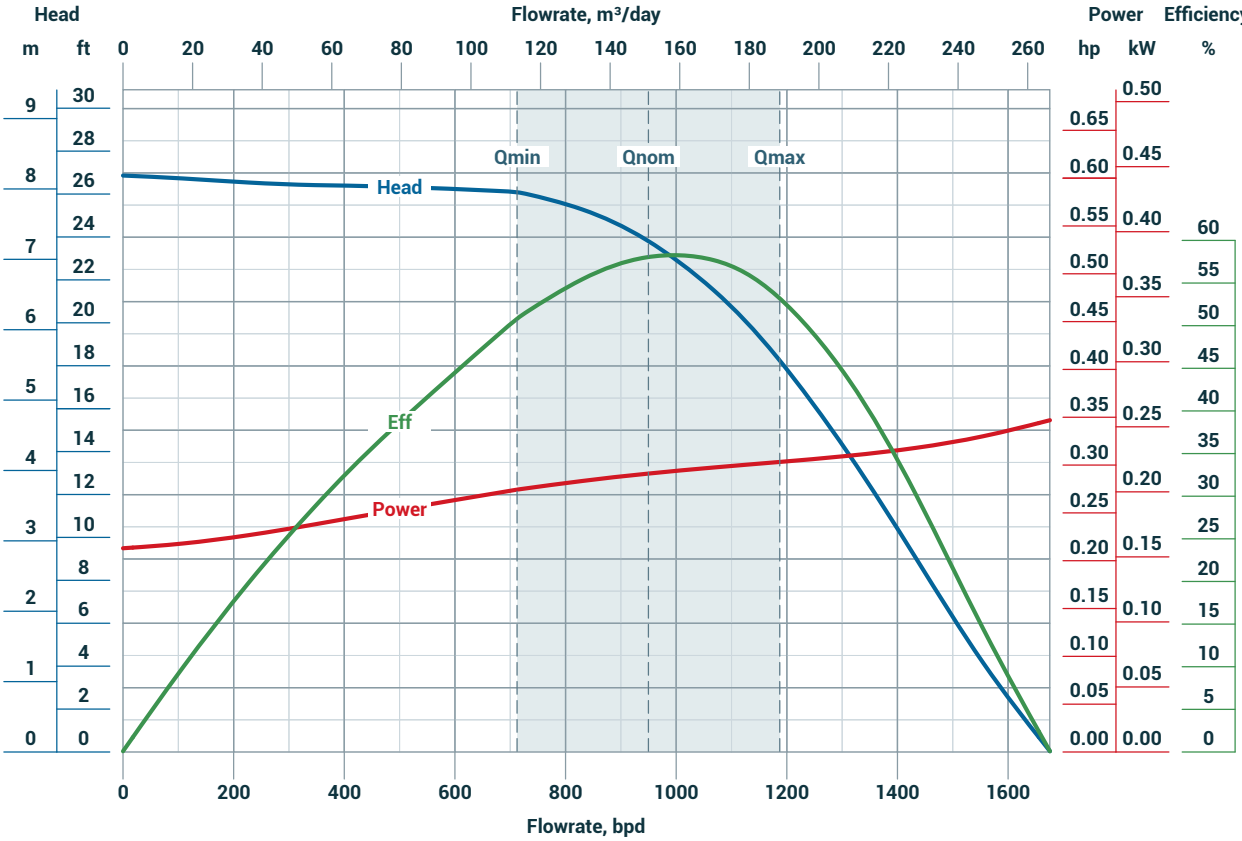
CONTENTS

362 SERIES PUMPS

Az ESP 362 - 950

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

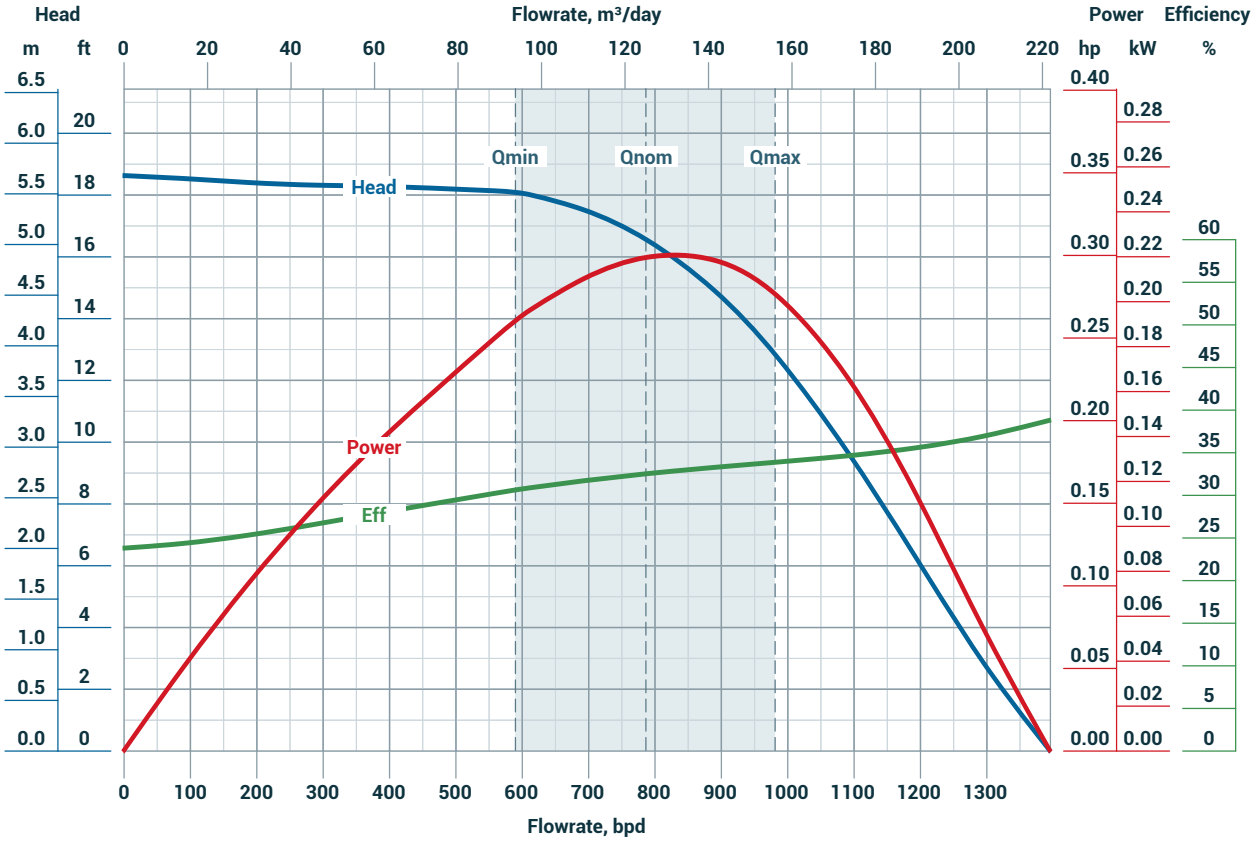
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	117,5 hp	86,4 kW
Recommended Operating Range	712-1188 bpd	113,2-188,88 m³/day		High Strength (S10)	132,2 hp	97,2 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	147 hp	108 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 950

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	98 hp	72 kW
Recommended Operating Range	589,67-982,78 bpd	93,75-156,25 m³/day		High Strength (S10)	110,1 hp	81 kW
Shaft Diameter	0,67 in	17 mm		Ultra High Strength (S11)	122,4 hp	90 kW
Shaft Cross Sectional Area	0,35 in²	227 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 1515

PUMP PERFORMANCE CURVE

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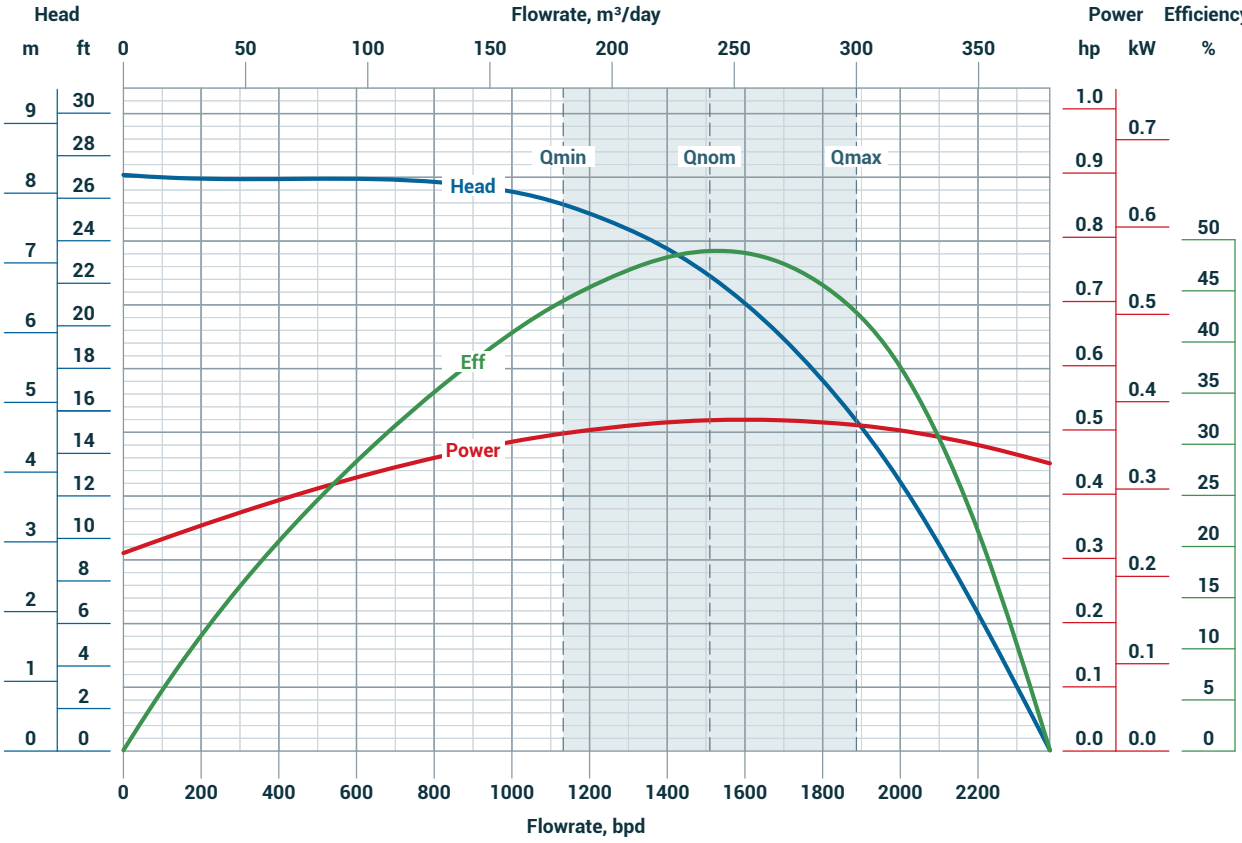


ENGINEERING DATA

@ 3492 RPM

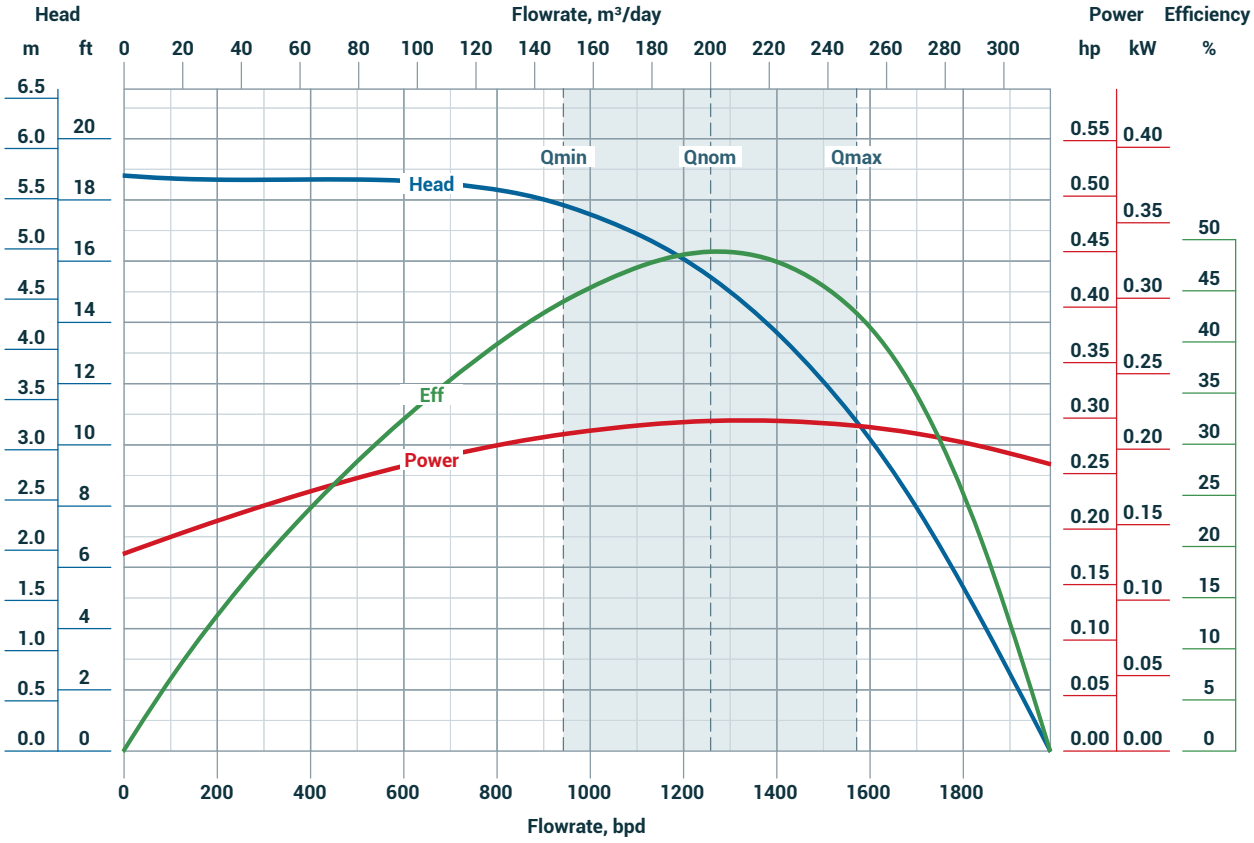
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	163,2 hp	120 kW
Recommended Operating Range	1136-1894 bpd	180-301,12 m³/day		High Strength (S10)	179,5 hp	132 kW
Shaft Diameter	0,79 in	20 mm		Ultra High Strength (S11)	196 hp	144 kW
Shaft Cross Sectional Area	0,49 in²	314 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

362 SERIES PUMPS

Az ESP 362 - 1515

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,74 in	120,4 mm	Rotational Direction		CW	
Housing Diameter	3,62 in	92 mm	Shaft Power Limit	Standard (S9)	136 hp	100 kW
Recommended Operating Range	943,47-1572,45 bpd	150-250 m³/day		High Strength (S10)	149,6 hp	110 kW
Shaft Diameter	0,79 in	20 mm		Ultra High Strength (S11)	163,2 hp	120 kW
Shaft Cross Sectional Area	0,49 in²	314 mm²	Housing Burst Pressure Limit		5265 psi	363 bar

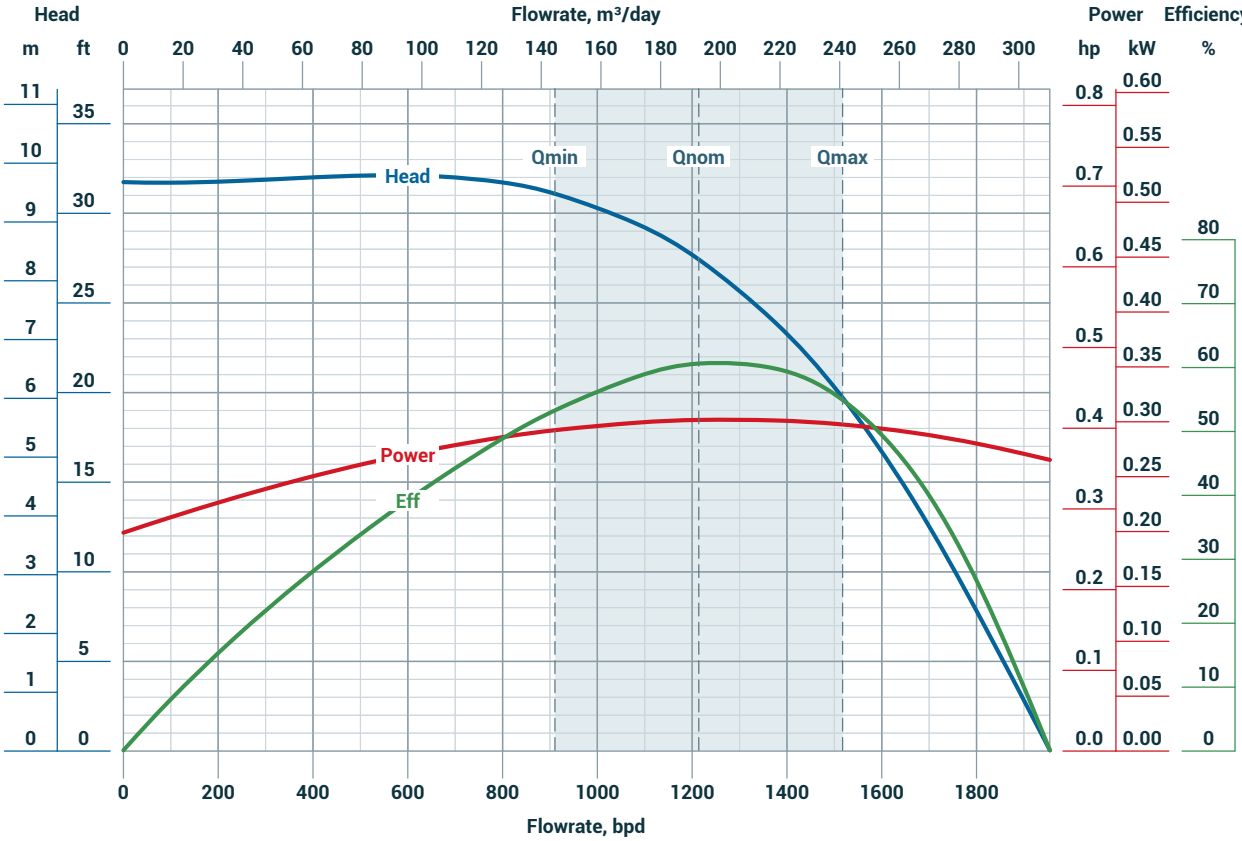
CONTENTS

406 SERIES PUMPS

Az ESP 406 - 1220

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

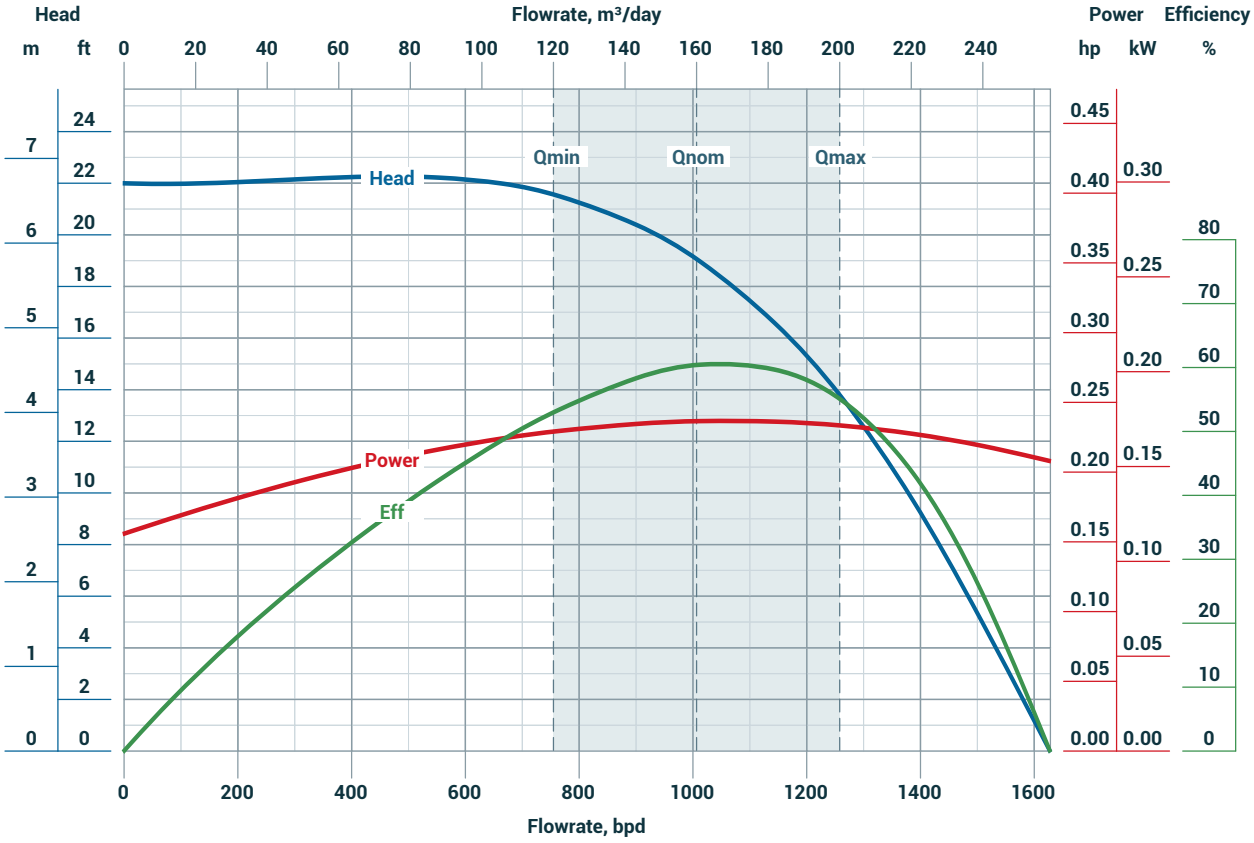
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	163,2 hp	120 kW
Recommended Operating Range	915-1525 bpd	145,47-242,46 m³/day		High Strength (S10)	179,5 hp	132 kW
Shaft Diameter	0,79 in	20 mm		Ultra High Strength (S11)	196 hp	144 kW
Shaft Cross Sectional Area	0,49 in²	314 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 1220

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

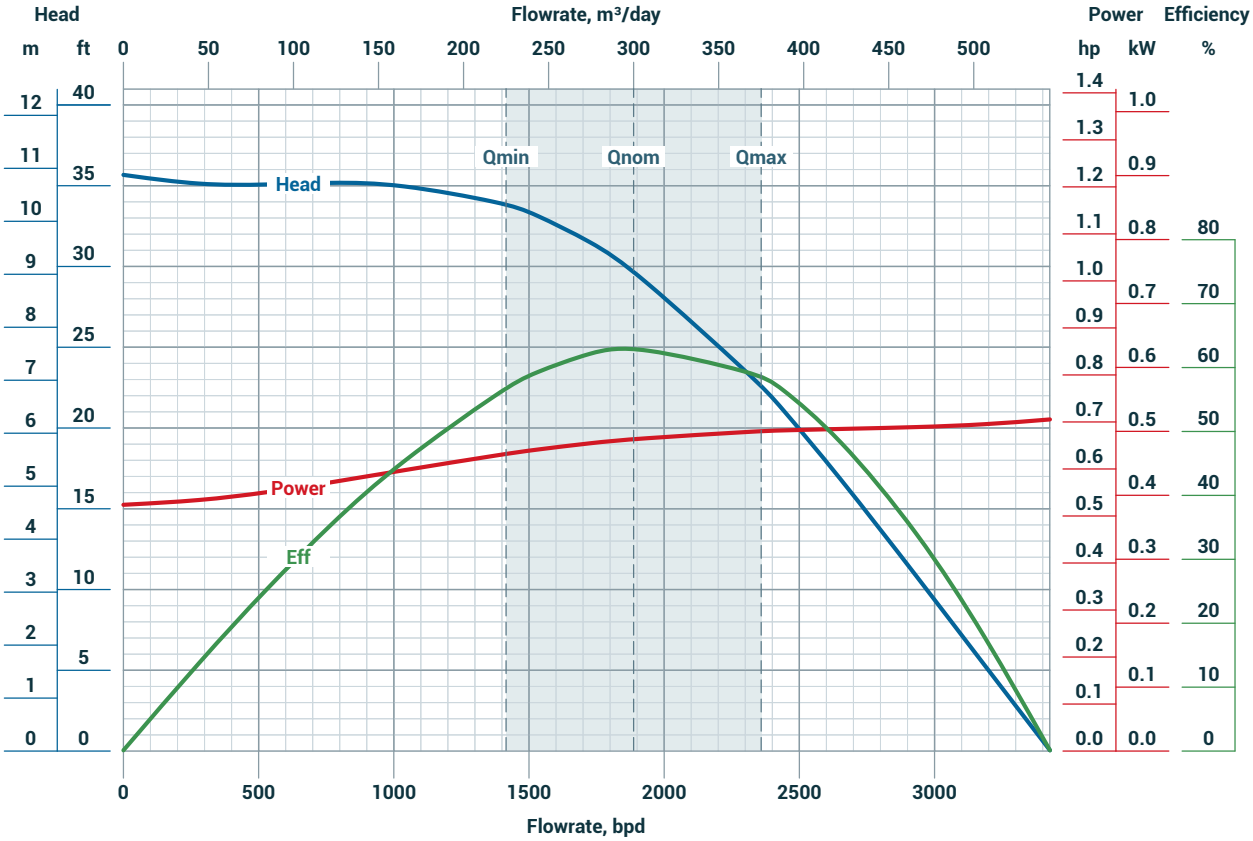
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	136 hp	100 kW
Recommended Operating Range	754,78-1257,96 bpd	120-200 m³/day		High Strength (S10)	149,6 hp	110 kW
Shaft Diameter	0,79 in	20 mm		Ultra High Strength (S11)	163,2 hp	120 kW
Shaft Cross Sectional Area	0,49 in²	314 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 1890

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

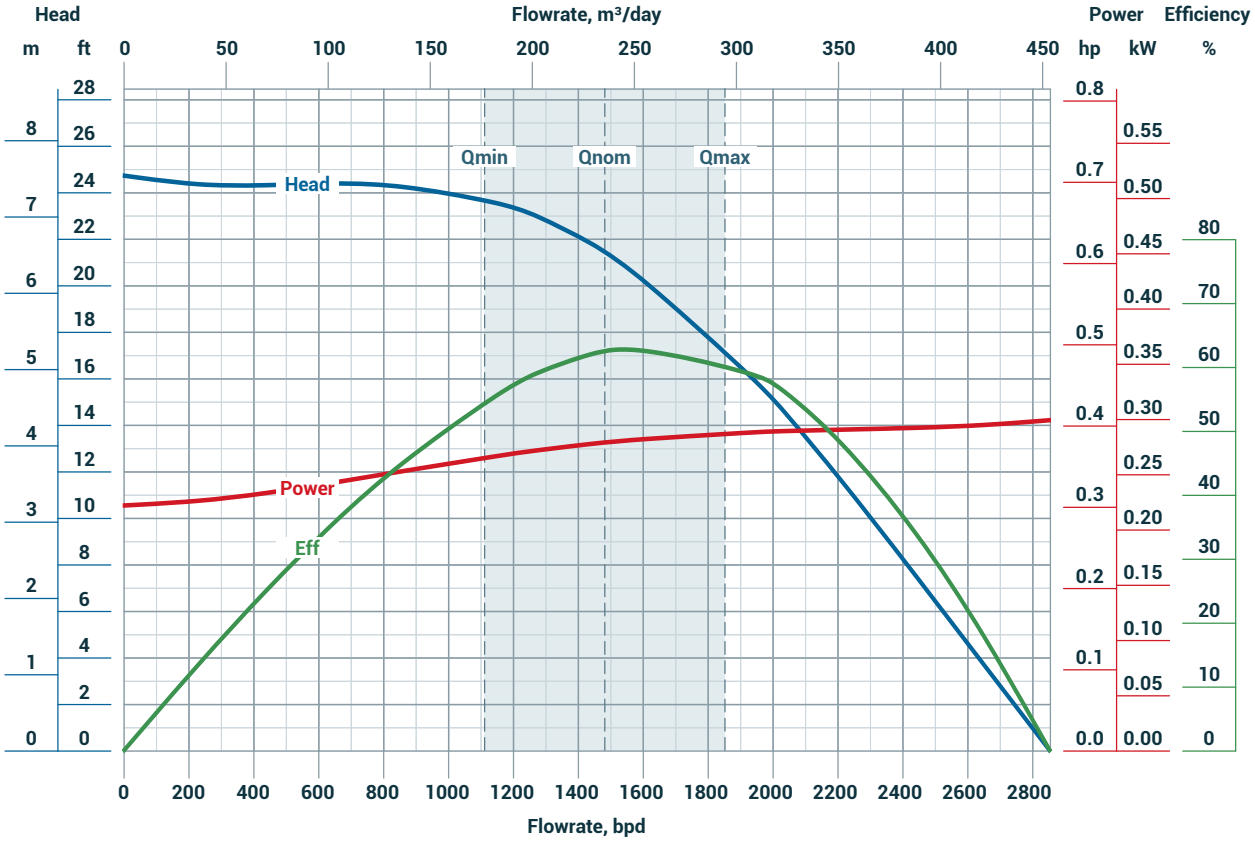
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	235 hp	172,8 kW
Recommended Operating Range	1417-2363 bpd	225,29-375,69 m³/day		High Strength (S10)	269,3 hp	198 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	303,5 hp	223,2 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 1890

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

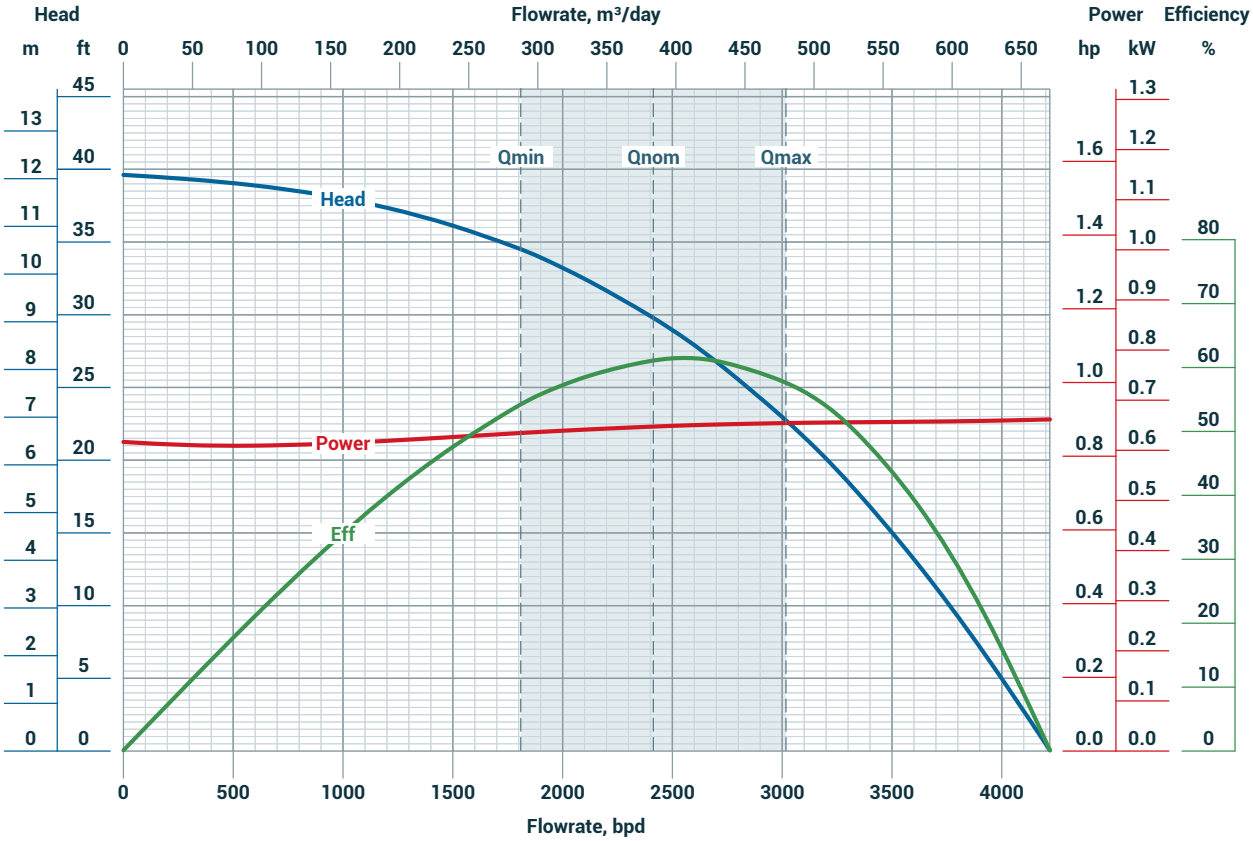
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	196 hp	144 kW
Recommended Operating Range	1179,34-1965,57 bpd	187,5-312,5 m³/day		High Strength (S10)	224,3 hp	165 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	252,9 hp	186 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 2420

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

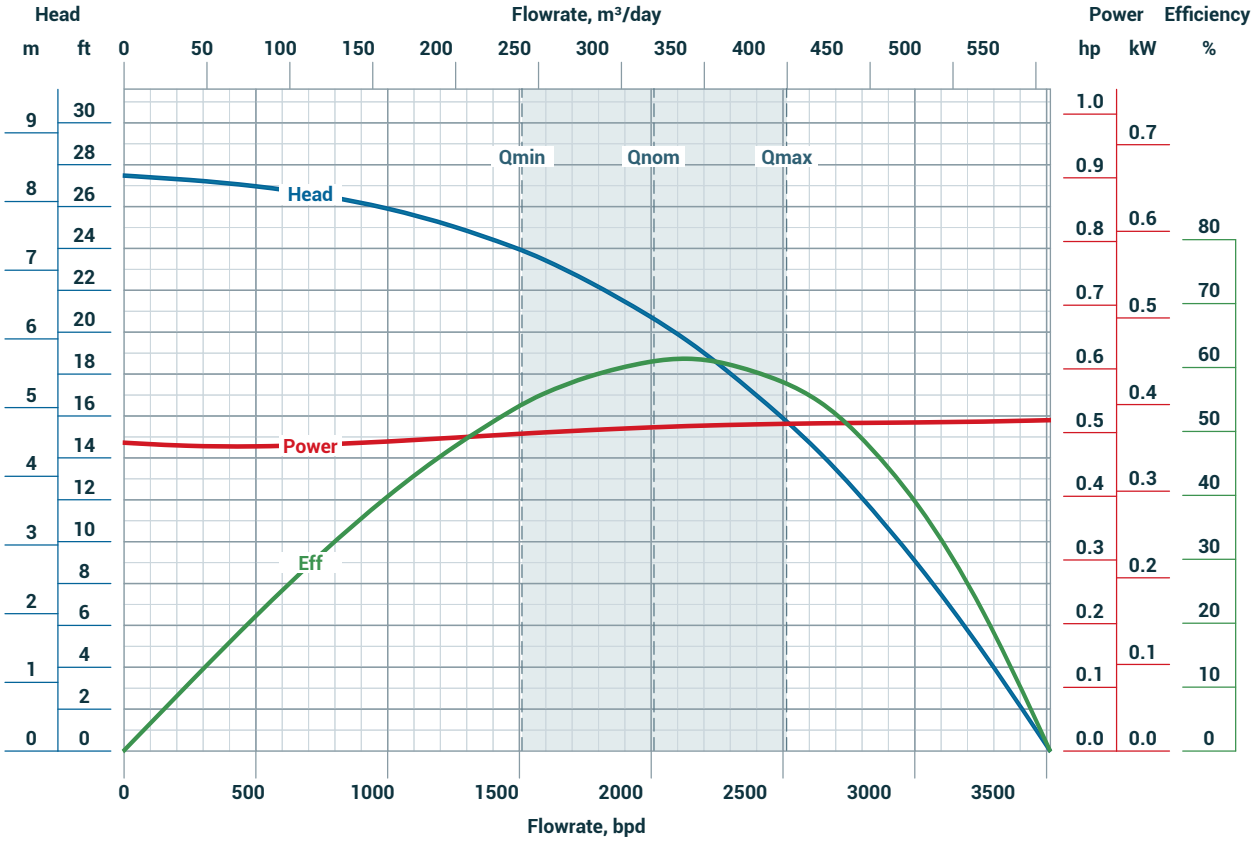
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	235 hp	172,8 kW
Recommended Operating Range	1815-3025 bpd	288,56-480,94 m³/day		High Strength (S10)	269,3 hp	198 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	303,5 hp	223,2 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 2420

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	196 hp	144 kW
Recommended Operating Range	1509,55-2515,92 bpd	240-400 m³/day		High Strength (S10)	224,3 hp	165 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	252,9 hp	186 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

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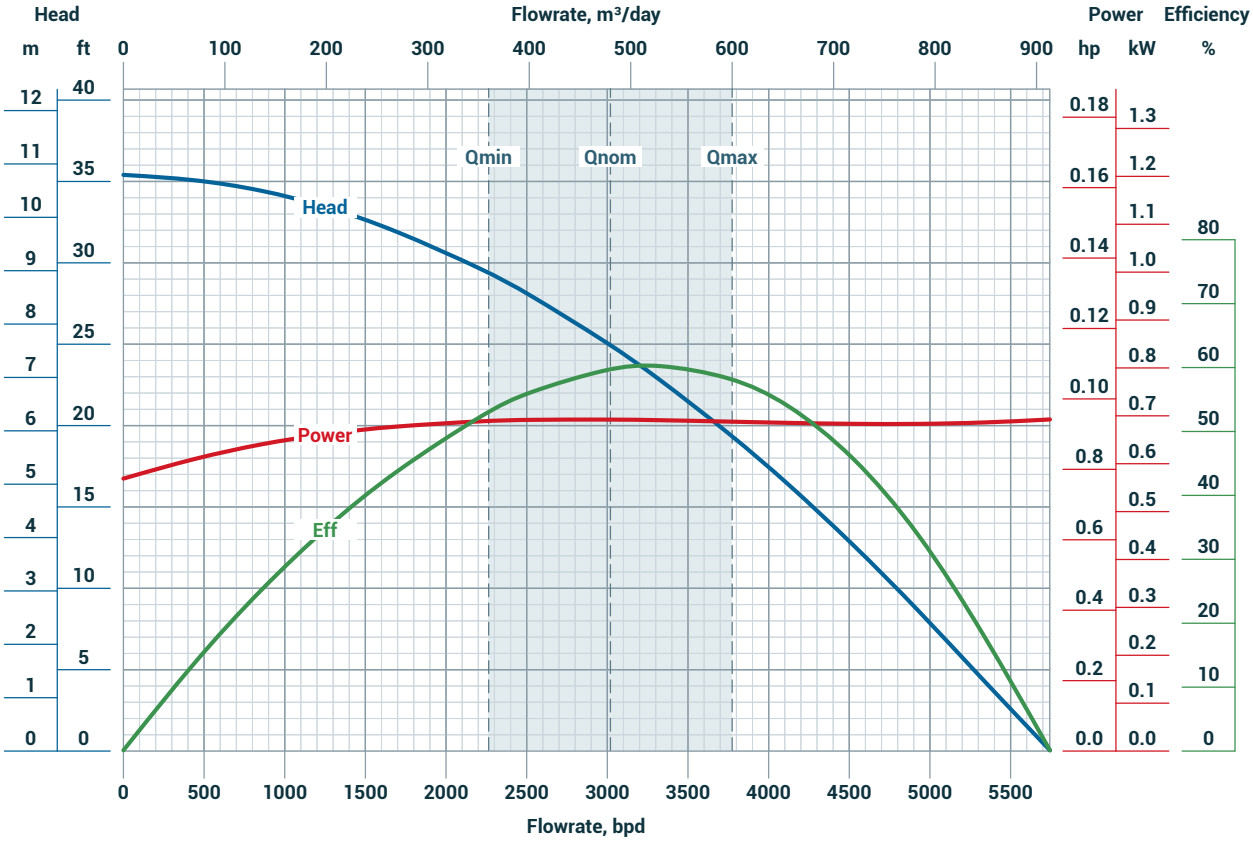
406 SERIES PUMPS

Az ESP 406 - 3020

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

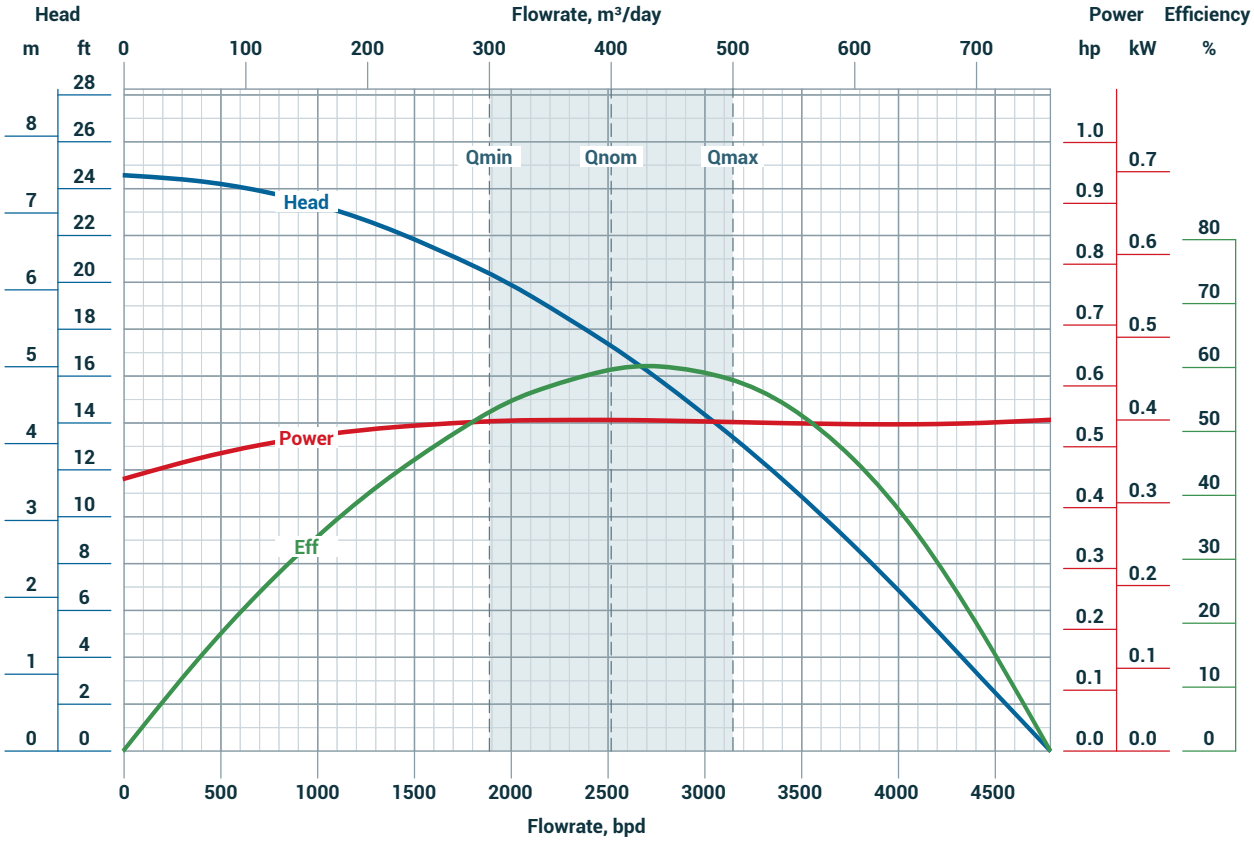
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	235 hp	172,8 kW
Recommended Operating Range	2265-3775 bpd	360,11-600,18 m³/day		High Strength (S10)	269,3 hp	198 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	303,5 hp	223,2 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 3020

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	196 hp	144 kW
Recommended Operating Range	1886,94-3144,91 bpd	300-500 m³/day		High Strength (S10)	224,3 hp	165 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	252,9 hp	186 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

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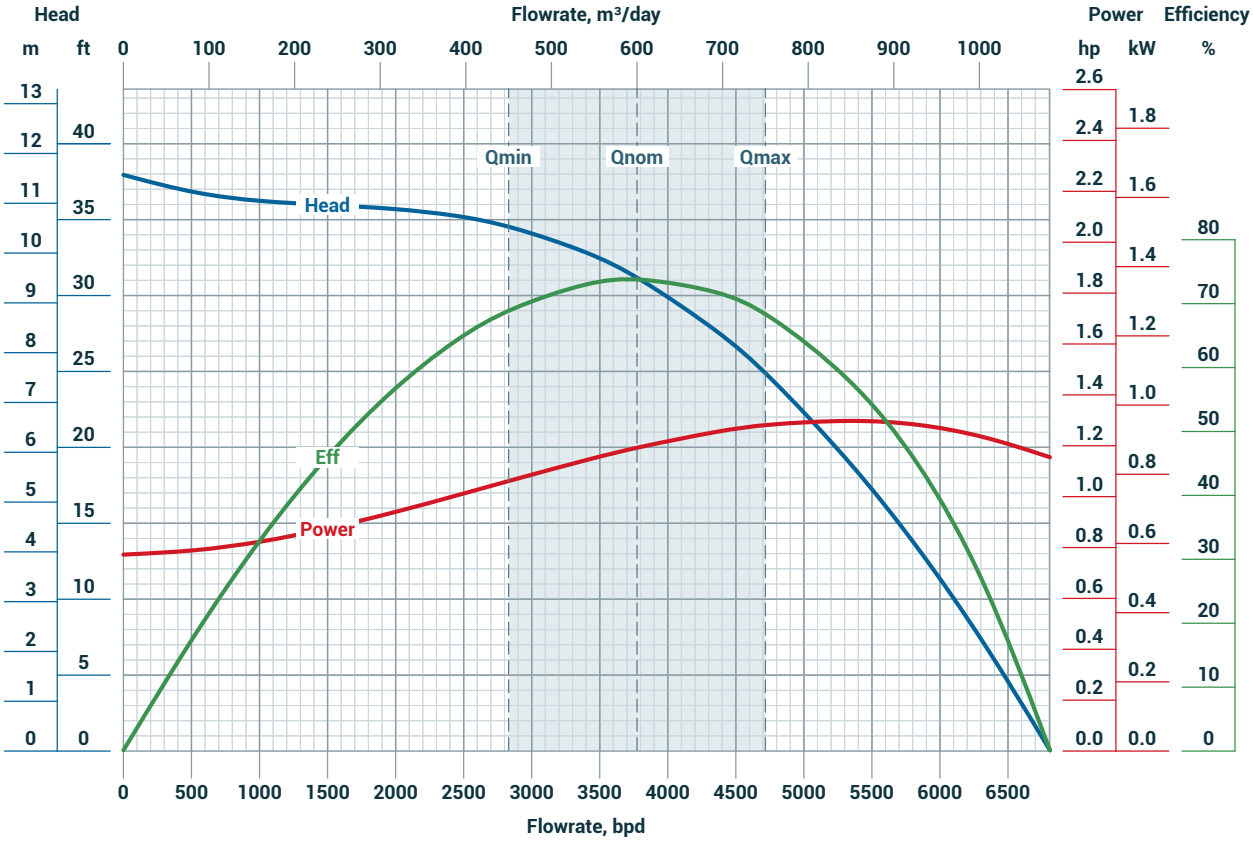
406 SERIES PUMPS

Az ESP 406 - 3780

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

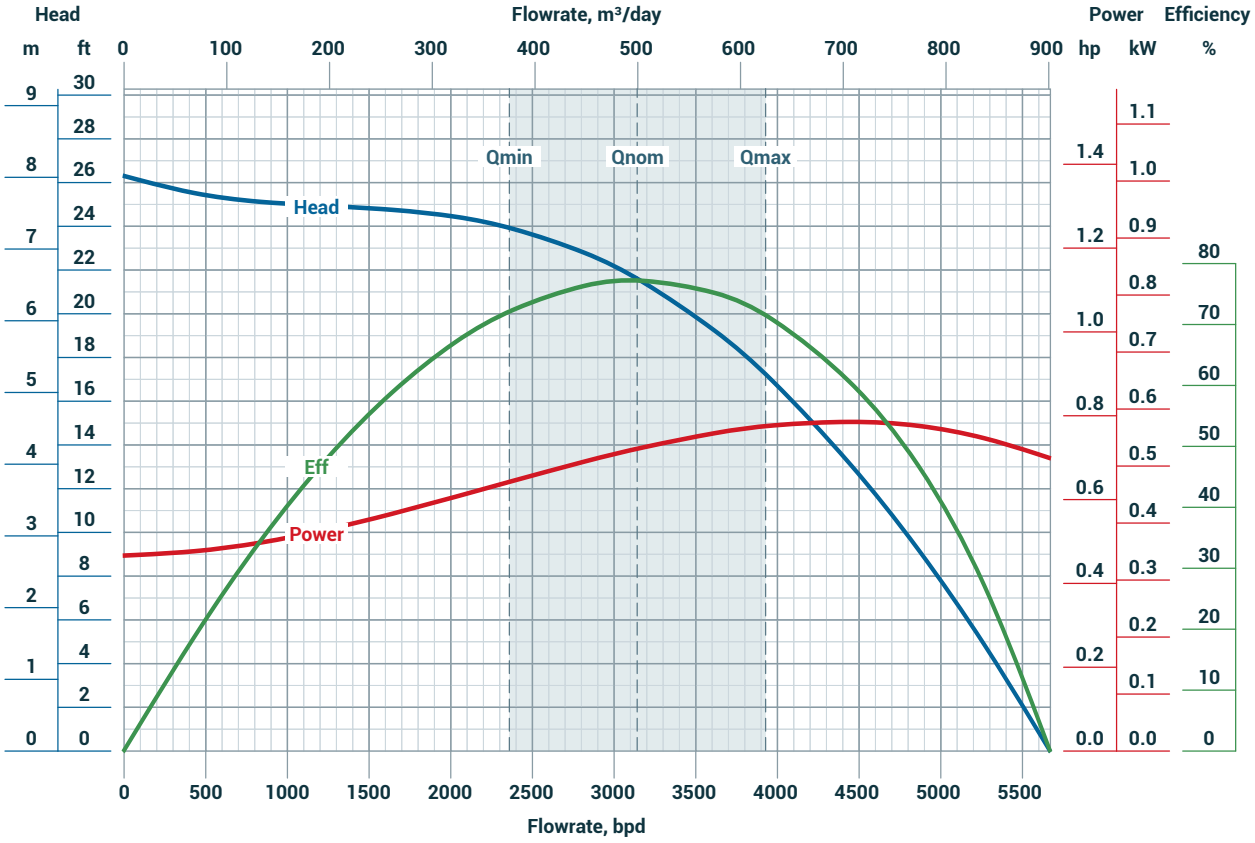
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	235 hp	172,8 kW
Recommended Operating Range	2835-4725 bpd	450,73-751,22 m³/day		High Strength (S10)	269,3 hp	198 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	303,5 hp	223,2 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 3780

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

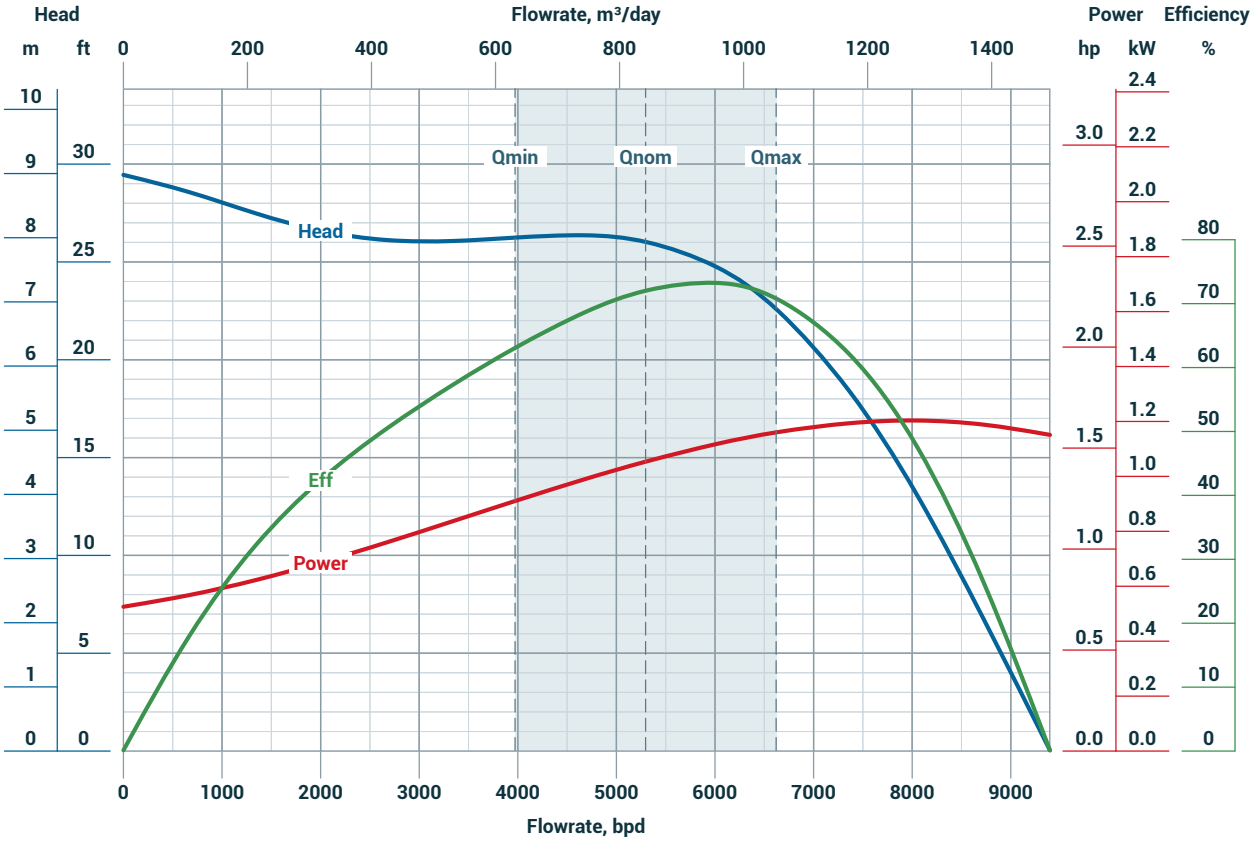
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	196 hp	144 kW
Recommended Operating Range	2358,68-3931,13 bpd	375-625 m³/day		High Strength (S10)	224,3 hp	165 kW
Shaft Diameter	0,87 in	22 mm		Ultra High Strength (S11)	252,9 hp	186 kW
Shaft Cross Sectional Area	0,59 in²	380 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 5300

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

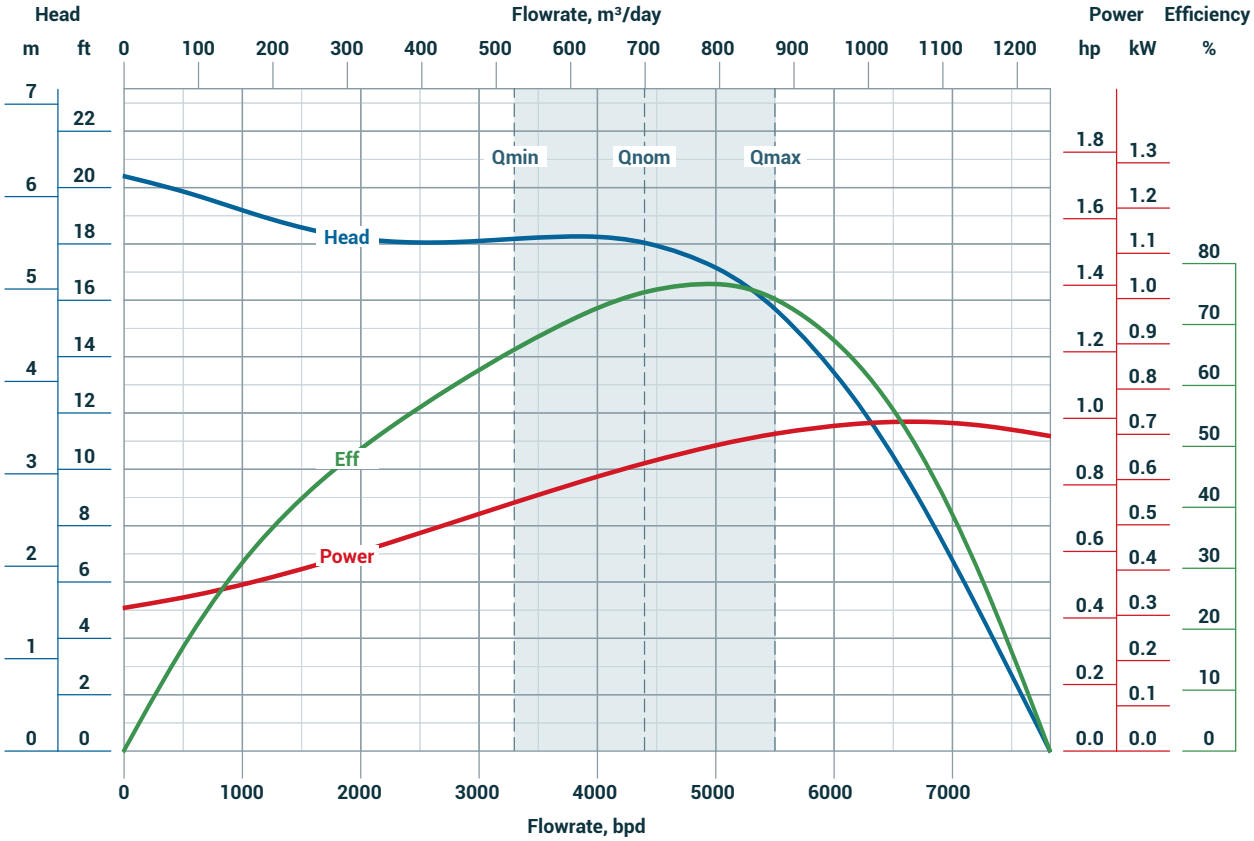
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	440,6 hp	324 kW
Recommended Operating Range	3975-6625 bpd	631,97-1053,3 m³/day		High Strength (S10)	490 hp	360 kW
Shaft Diameter	0,98 in	25 mm		Ultra High Strength (S11)	538,6 hp	396 kW
Shaft Cross Sectional Area	0,75 in²	491 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 5300

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

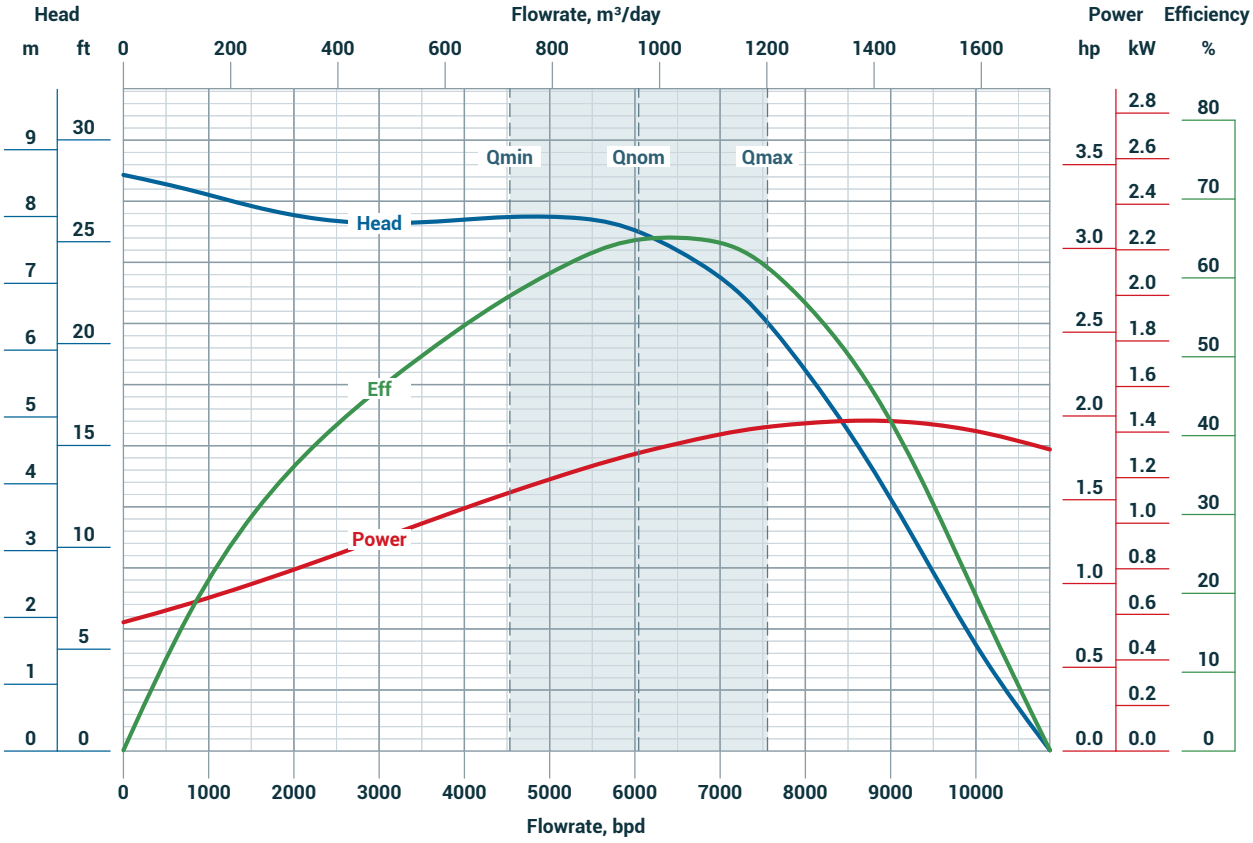
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	367,1 hp	270 kW
Recommended Operating Range	3302,15-5503,58 bpd	525-875 m³/day		High Strength (S10)	407,9 hp	300 kW
Shaft Diameter	0,98 in	25 mm		Ultra High Strength (S11)	448,7 hp	330 kW
Shaft Cross Sectional Area	0,75 in²	491 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 6050

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

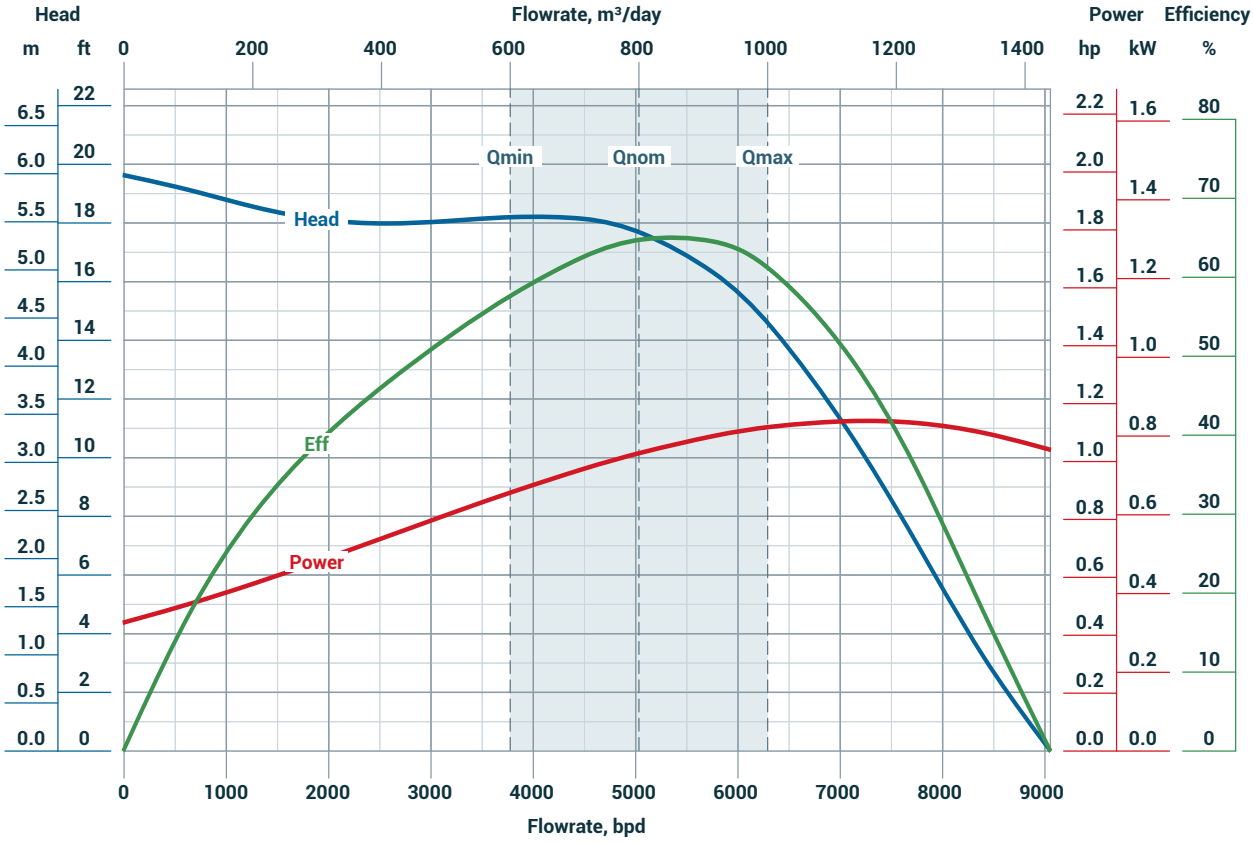
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	440,6 hp	324 kW
Recommended Operating Range	4537-7563 bpd	721,33-1202,42 m³/day		High Strength (S10)	490 hp	360 kW
Shaft Diameter	0,98 in	25 mm		Ultra High Strength (S11)	538,6 hp	396 kW
Shaft Cross Sectional Area	0,75 in²	491 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

406 SERIES PUMPS

Az ESP 406 - 6050

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

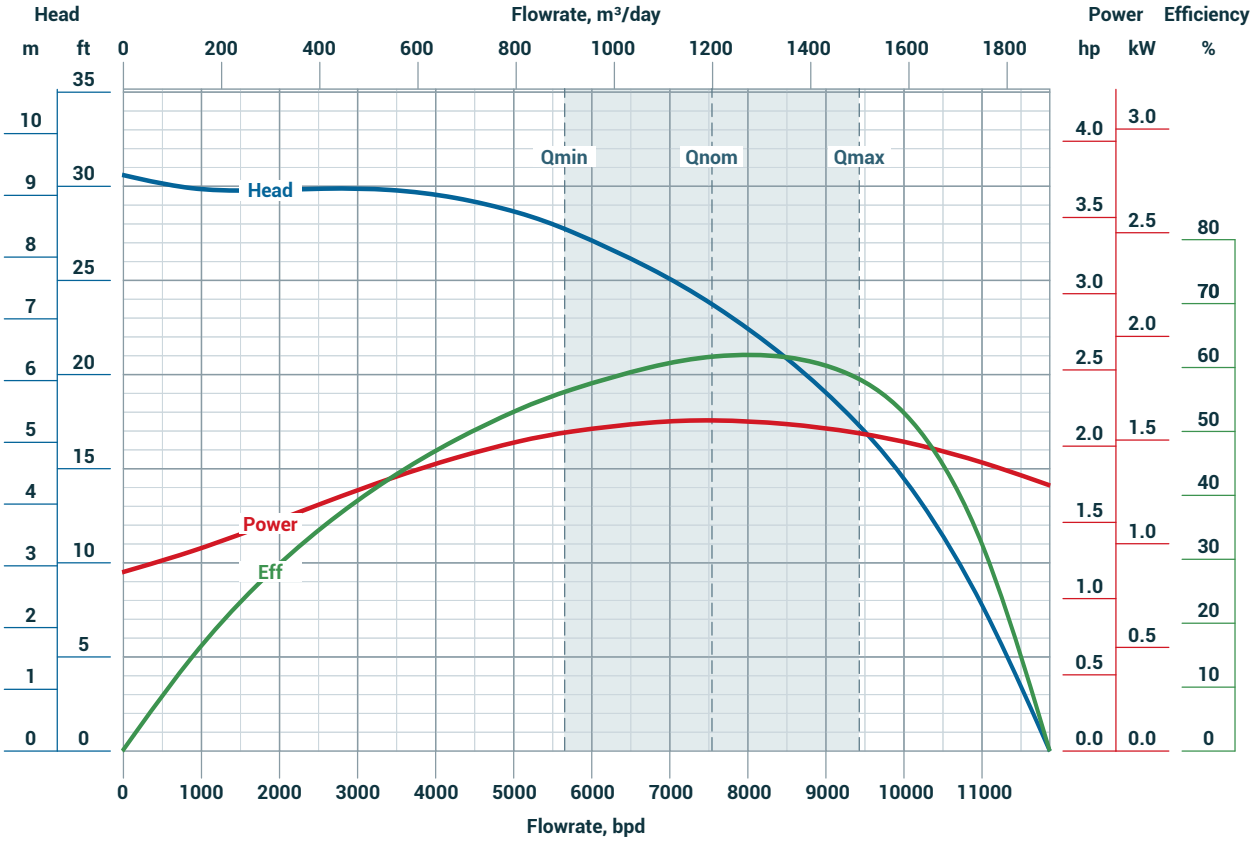
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	4,95 in	125,8 mm	Rotational Direction		CW	
Housing Diameter	4,06 in	103 mm	Shaft Power Limit	Standard (S9)	367,1 hp	270 kW
Recommended Operating Range	3773,89-6289,81 bpd	600-1000 m³/day		High Strength (S10)	407,9 hp	300 kW
Shaft Diameter	0,98 in	25 mm		Ultra High Strength (S11)	448,7 hp	330 kW
Shaft Cross Sectional Area	0,75 in²	491 mm²	Housing Burst Pressure Limit		5221 psi	360 bar

449 SERIES PUMPS

Az ESP 449 - 7550

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

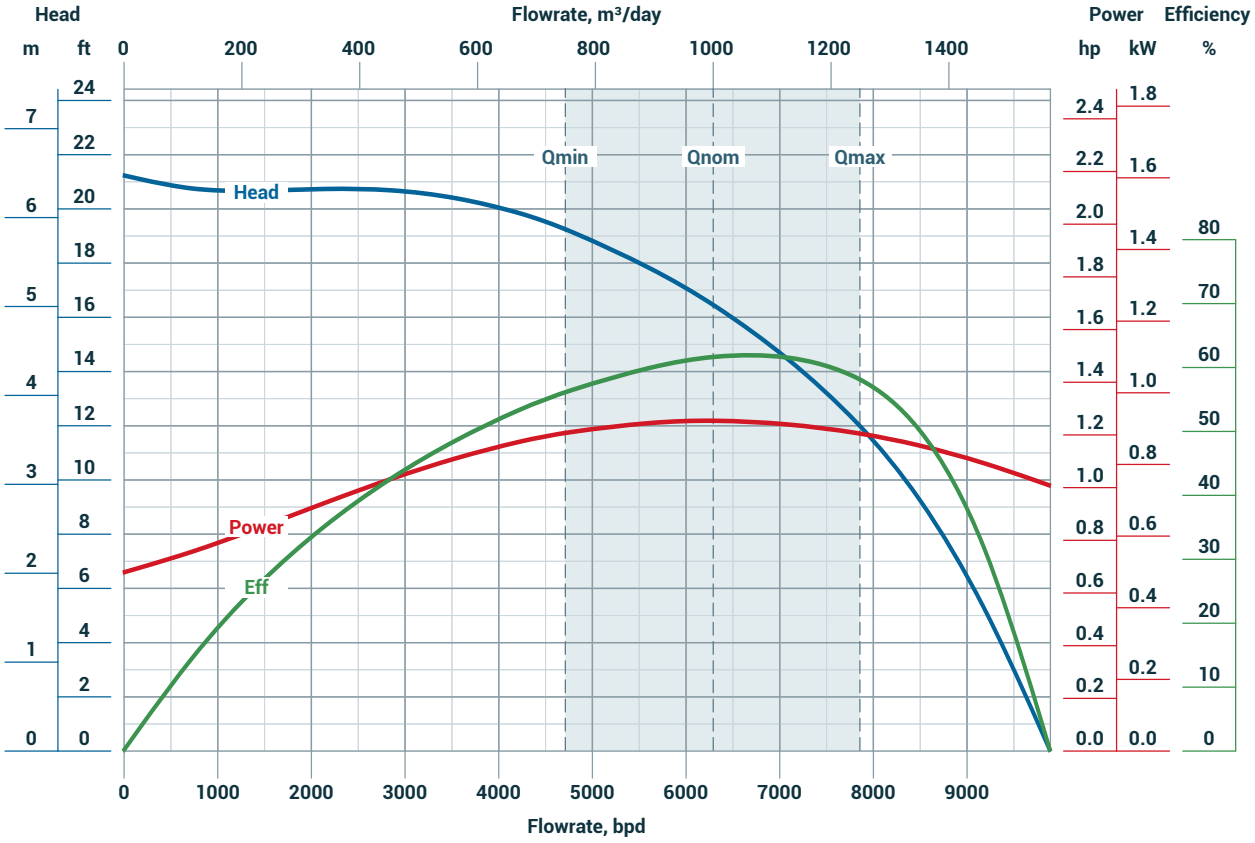
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	5,41 in	137,5 mm	Rotational Direction		CW	
Housing Diameter	4,49 in	114 mm	Shaft Power Limit	Standard (S9)	649,5 hp	477,6 kW
Recommended Operating Range	5662-9438 bpd	900,35-1500,5 m³/day		High Strength (S10)	692 hp	508,8 kW
Shaft Diameter	1,18 in	30 mm		Ultra High Strength (S11)	734,4 hp	540 kW
Shaft Cross Sectional Area	1,09 in²	707 mm²	Housing Burst Pressure Limit		5192 psi	358 bar

449 SERIES PUMPS

Az ESP 449 - 7550

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	5,41 in	137,5 mm	Rotational Direction		CW	
Housing Diameter	4,49 in	114 mm	Shaft Power Limit	Standard (S9)	541,1 hp	398 kW
Recommended Operating Range	4717,36-7862,26 bpd	750-1250 m³/day		High Strength (S10)	576,5 hp	424 kW
Shaft Diameter	1,18 in	30 mm		Ultra High Strength (S11)	611,8 hp	450 kW
Shaft Cross Sectional Area	1,09 in²	707 mm²	Housing Burst Pressure Limit		5192 psi	358 bar

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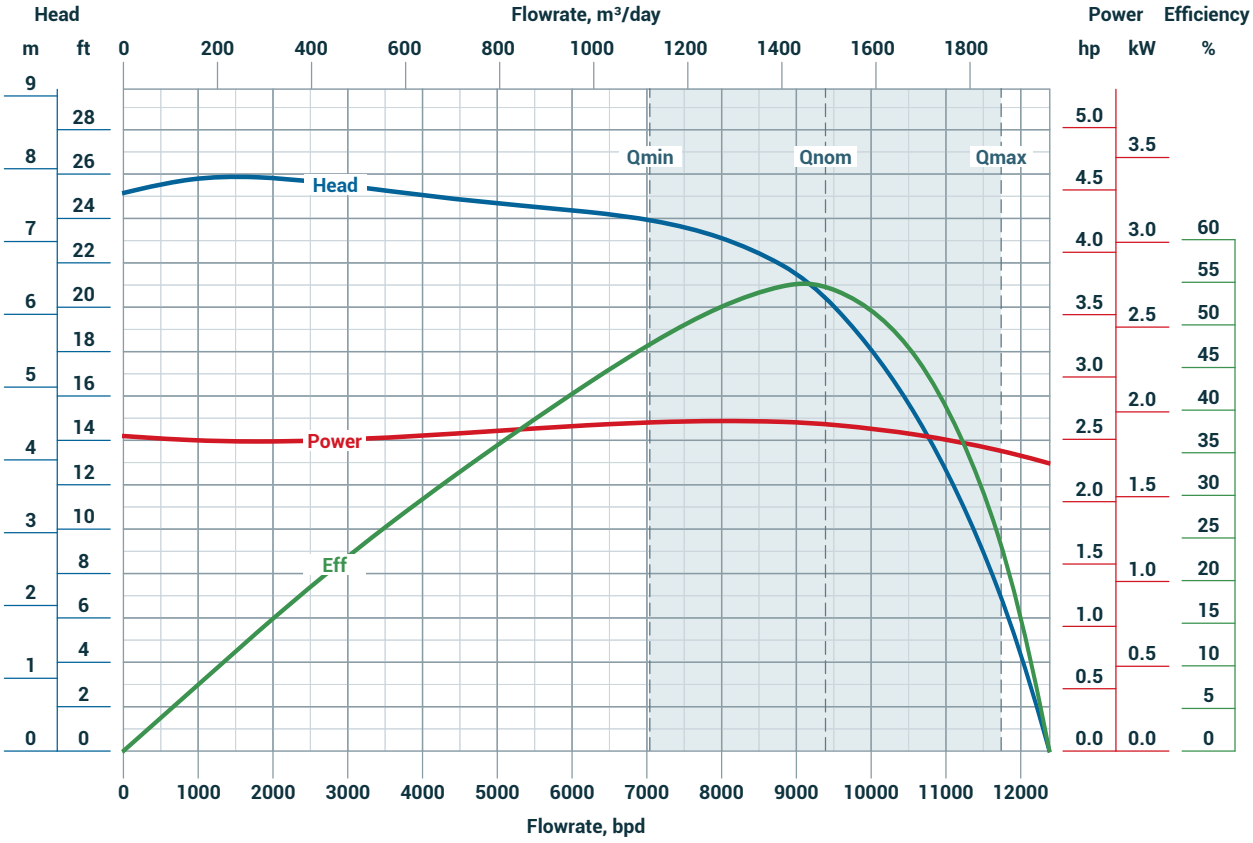
449 SERIES PUMPS

Az ESP 449 - 9400

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 60 HZ



ENGINEERING DATA

@ 3492 RPM

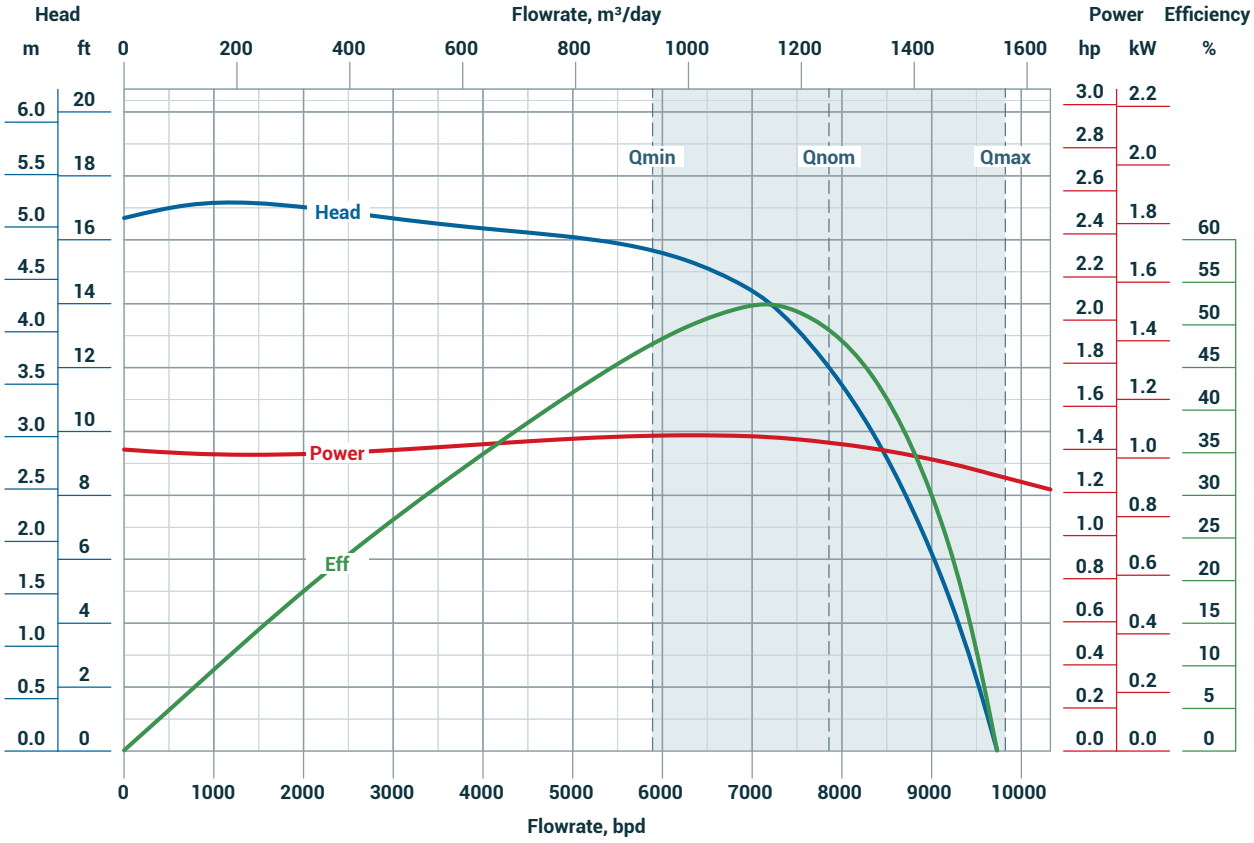
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	5,41 in	137,5 mm	Rotational Direction		CW	
Housing Diameter	4,49 in	114 mm	Shaft Power Limit	Standard (S9)	649,5 hp	477,6 kW
Recommended Operating Range	7050-11750 bpd	1120,86-1868,1 m³/day		High Strength (S10)	692 hp	508,8 kW
Shaft Diameter	1,18 in	30 mm		Ultra High Strength (S11)	734,4 hp	540 kW
Shaft Cross Sectional Area	1,09 in²	707 mm²	Housing Burst Pressure Limit		5192 psi	358 bar

449 SERIES PUMPS

Az ESP 449 - 9400

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 50 HZ



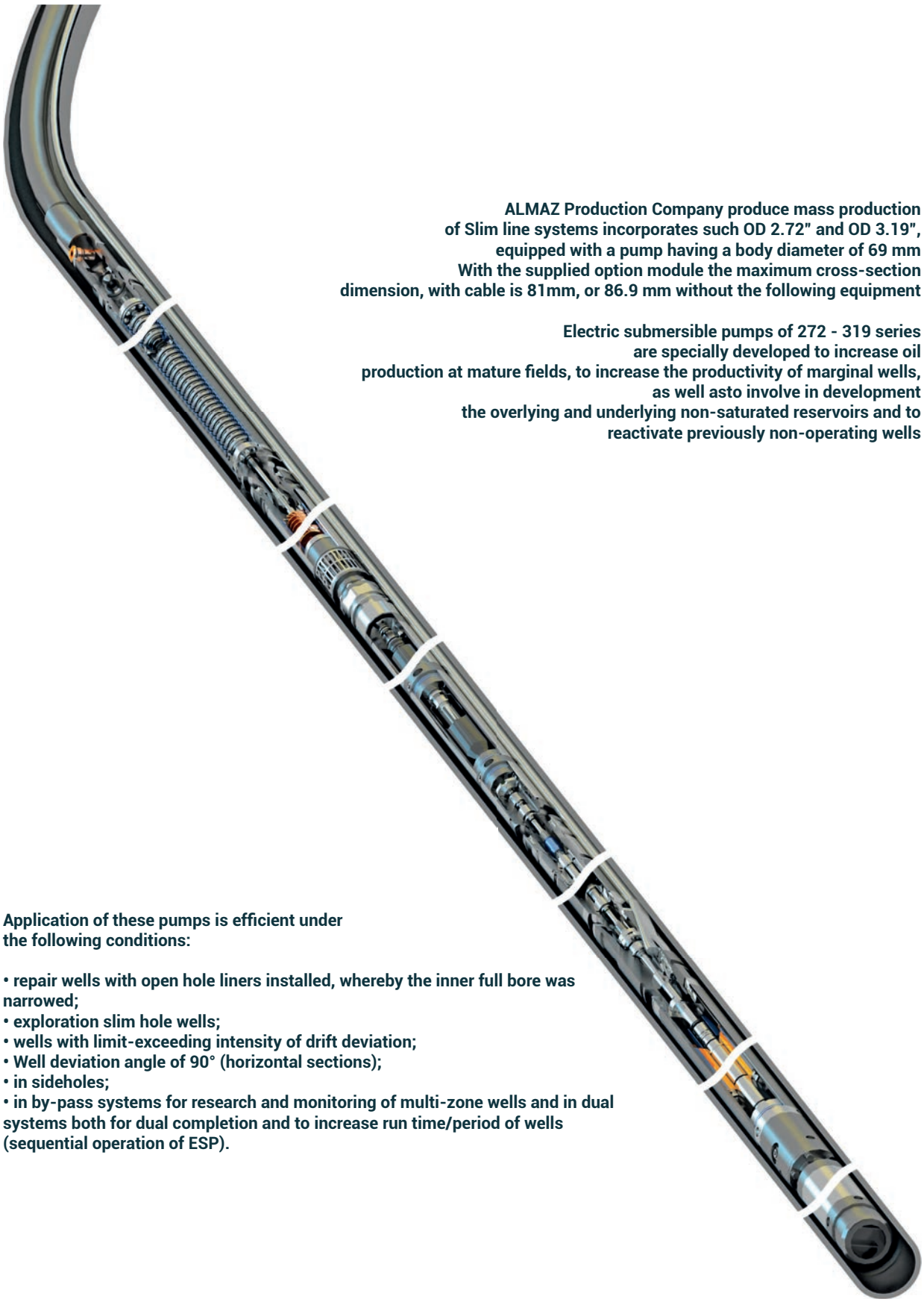
ENGINEERING DATA

@ 2910 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	5,41 in	137,5 mm	Rotational Direction		CW	
Housing Diameter	4,49 in	114 mm	Shaft Power Limit	Standard (S9)	541,1 hp	398 kW
Recommended Operating Range	5896,7-9827,83 bpd	937,5-1562,5 m³/day		High Strength (S10)	576,5 hp	424 kW
Shaft Diameter	1,18 in	30 mm		Ultra High Strength (S11)	611,8 hp	450 kW
Shaft Cross Sectional Area	1,09 in²	707 mm²	Housing Burst Pressure Limit		5192 psi	358 bar

Slimline ESP Systems

Electric Submersible Pump High-speed



ALMAZ Production Company produce mass production of Slim line systems incorporates such OD 2.72" and OD 3.19", equipped with a pump having a body diameter of 69 mm With the supplied option module the maximum cross-section dimension, with cable is 81mm, or 86.9 mm without the following equipment

Electric submersible pumps of 272 - 319 series are specially developed to increase oil production at mature fields, to increase the productivity of marginal wells, as well asto involve in development the overlying and underlying non-saturated reservoirs and to reactivate previously non-operating wells

Application of these pumps is efficient under the following conditions:

- repair wells with open hole liners installed, whereby the inner full bore was narrowed;
- exploration slim hole wells;
- wells with limit-exceeding intensity of drift deviation;
- Well deviation angle of 90° (horizontal sections);
- in sideholes;
- in by-pass systems for research and monitoring of multi-zone wells and in dual systems both for dual completion and to increase run time/period of wells (sequential operation of ESP).

Slimline ESP Systems

Electric Submersible Pump High-speed

EXAMPLE

Az ESPHS 272-1260 5M 84STG P UT S9 TT2 CR1 NBR

Az	ESPHS	272	1260			5M	84STG	P	UT	S9	TT2	CR1	NBR
1	2	3	4	5	6	7	8	9	10	11	12	13	14

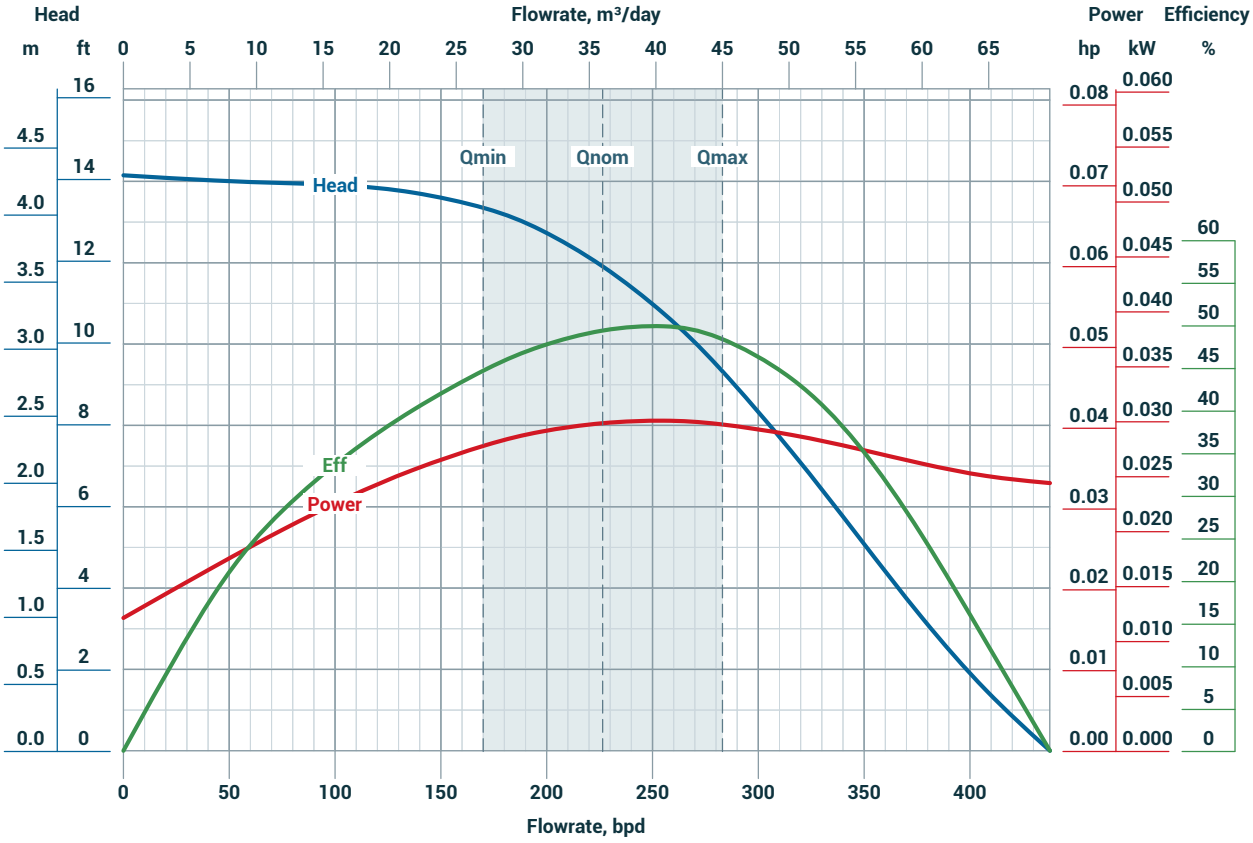
1	Manufacturer ALMAZ Production Company
2	Electric Submersible Pump High-speed (ESPHS)
3	ESP series
4	Pump flow rate (bpd) @ 60 Hz
5	Stage material: No code – Ni-Resist N4 – Ni-Resist type 4
6	Rotation direction: No code – clockwise CCW – counter-clockwise
7	Housing length, m
8	Number of stages
9	Pump design: C – compression F – floater P – packet
10	Pump configuration: UT – upper tandem CT – central tandem LT – lower tandem
11	Shaft material: Stainless steel S9 - Stainless steel (882 MPa) S10 - Stainless steel (980 MPa) S11 - Stainless steel (1080 MPa) INCONEL 718 I8 - Inconel alloy (785 MPa) I10 - Inconel alloy (980 MPa) I12 - Inconel alloy (1180 MPa) MONEL K-500 M8 - Monel alloy (785 Mpa)
12	Bearings Material: TT1 – tungsten carbide sleeve and bearing every 1 meter TT2 – tungsten carbide sleeve and bearing every 0.5 meters TT3 – tungsten carbide sleeve and bearing every 0.35 meters
13	Corrosion resistance design: CR0 – carbon steel head, base and housing, carbon steel fasteners CR1 – stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating),monel fasteners CR2 – stainless steel head, base and housing, monel fasteners
14	Elastomers material: NBR – Nitrile butadiene rubber HNBR – Hydrogenated nitrile butadiene rubber

272 SERIES PUMPS

Az ESPHS 272-230

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 3492 rpm



ENGINEERING DATA

@ 3492 rpm

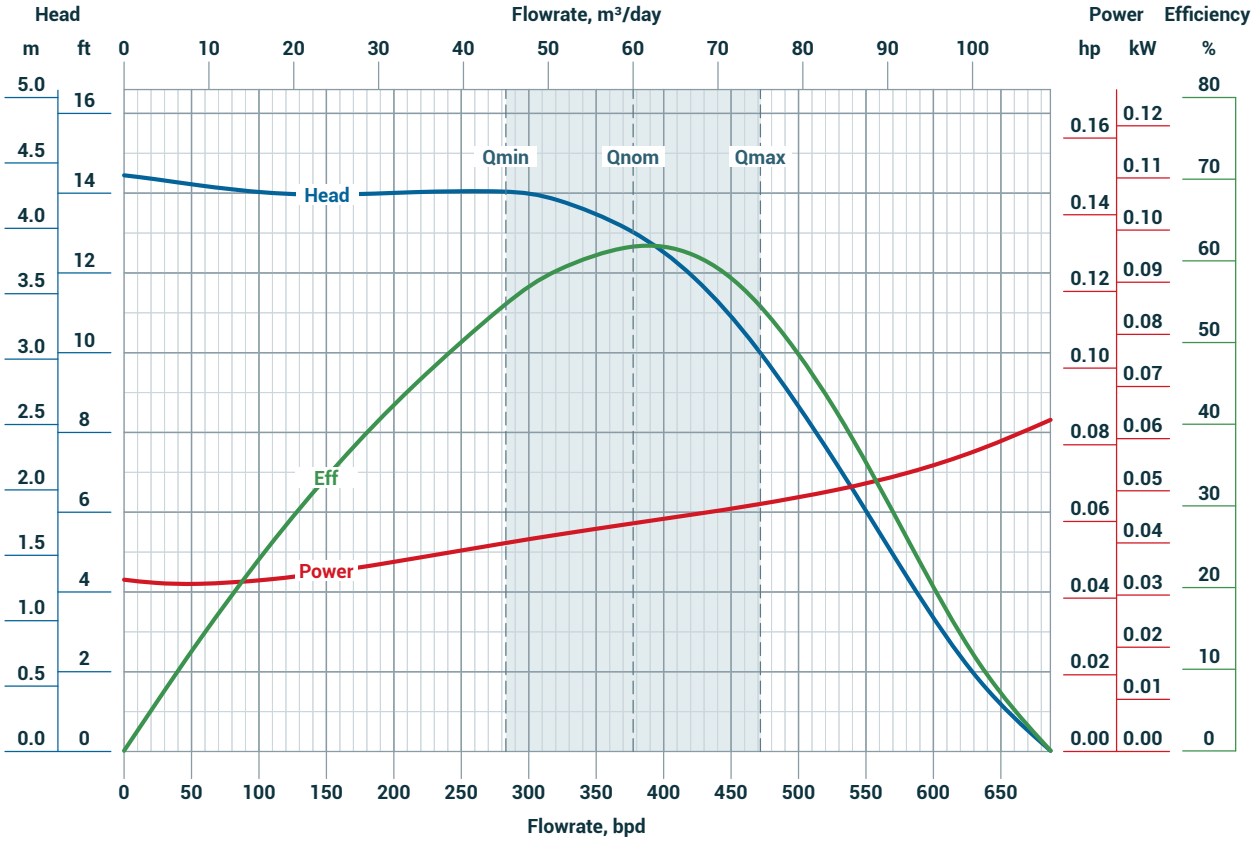
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	65,3 hp	48 kW
Recommended Operating Range	172-288 bpd	27,35-45,8 m³/day		High Strength (S10)	73,4 hp	54 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	81,6 hp	60 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

272 SERIES PUMPS

Az ESPHS 272-380

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 3492 rpm



ENGINEERING DATA

@ 3492 rpm

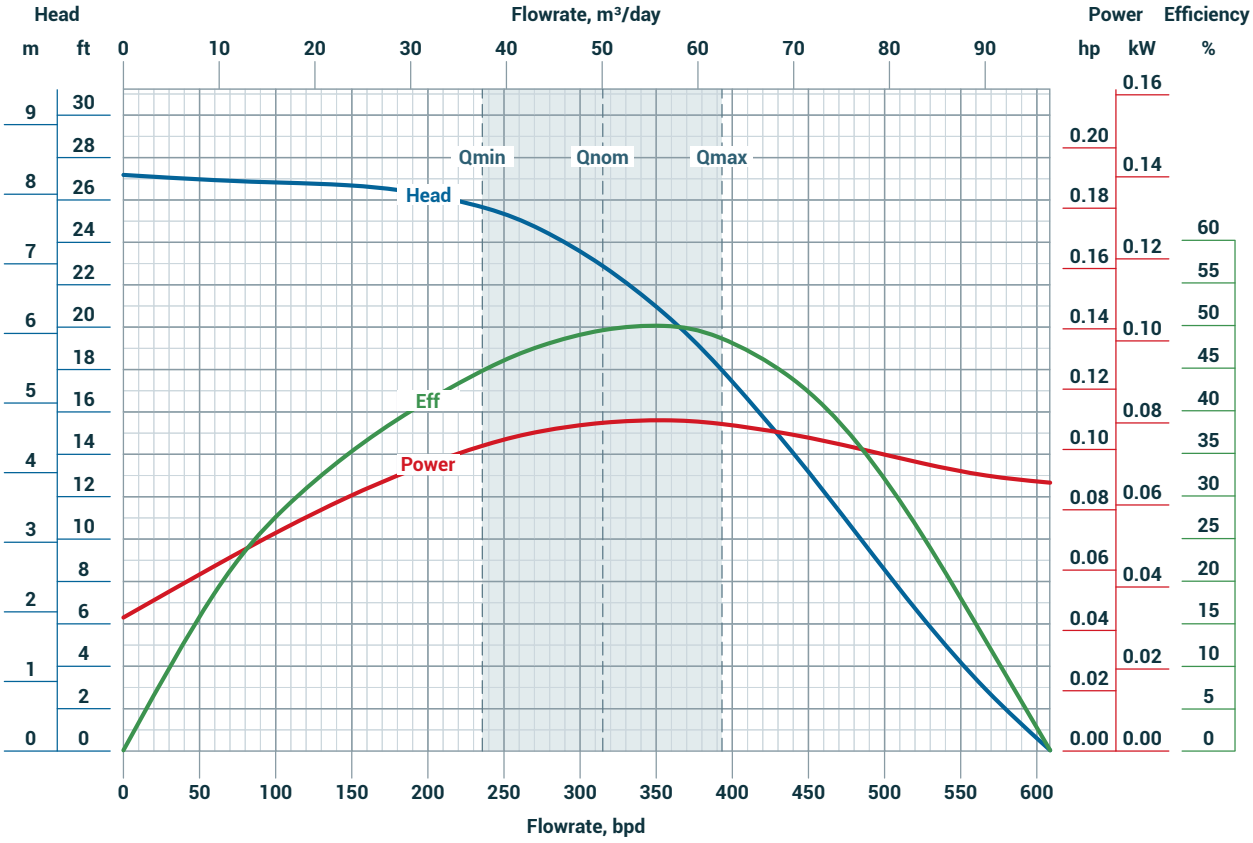
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	65,3 hp	48 kW
Recommended Operating Range	285-475 bpd	45,31-75,52 m³/day		High Strength (S10)	73,4 hp	54 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	81,6 hp	60 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

272 SERIES PUMPS

Az ESPHS 272-320

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 4850 rpm



ENGINEERING DATA

@ 4850 rpm

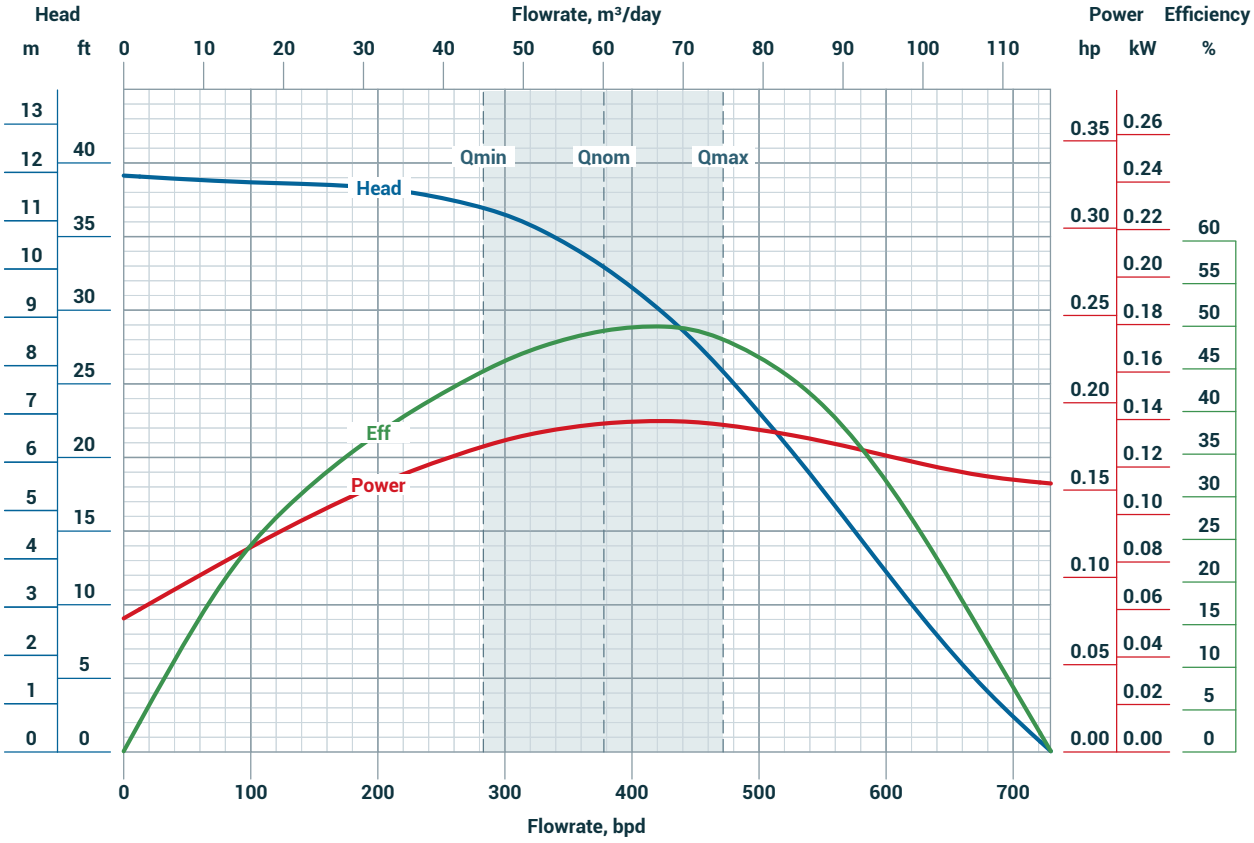
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	91 hp	67 kW
Recommended Operating Range	240-400 bpd	38,16-63,6 m³/day		High Strength (S10)	102 hp	75 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	113,5 hp	83,5 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

272 SERIES PUMPS

Az ESPHS 272-380

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 5820 rpm



ENGINEERING DATA

@ 5820 rpm

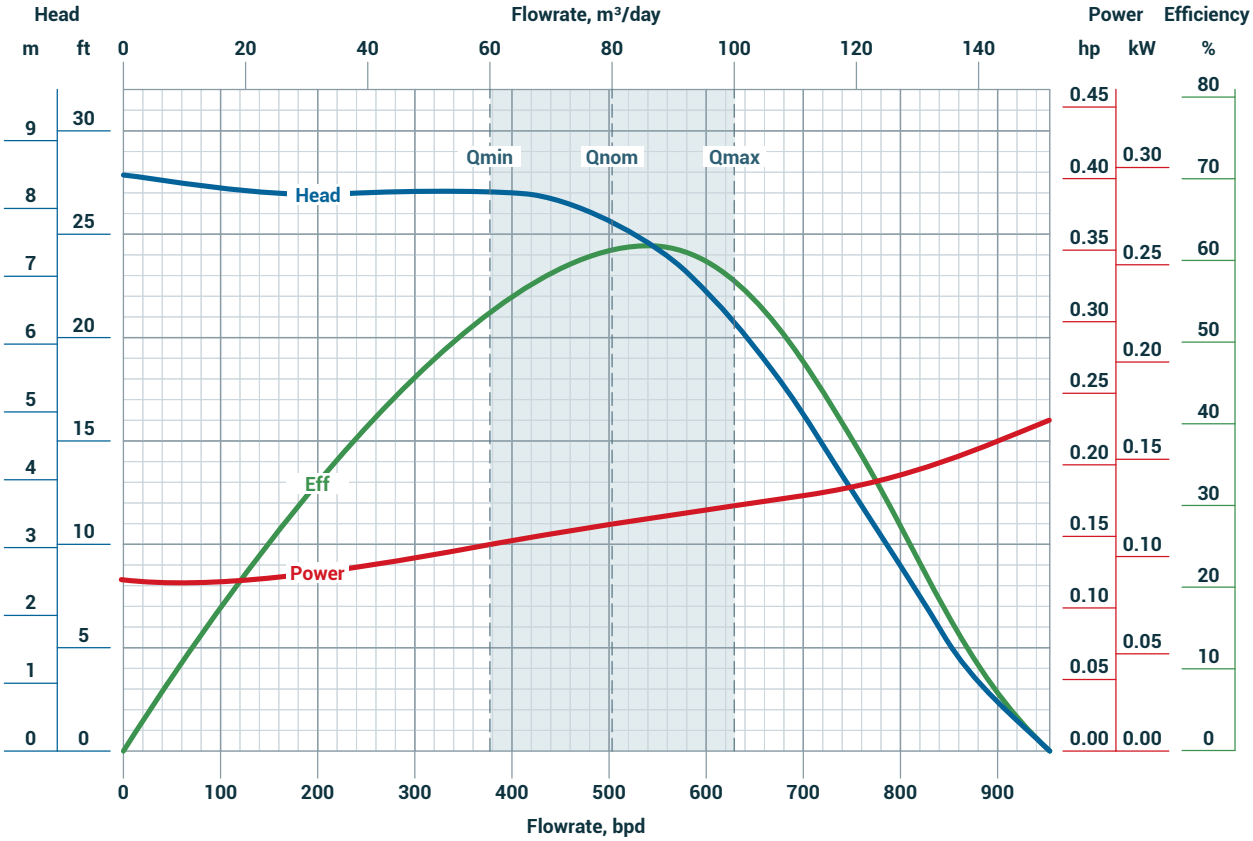
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	109 hp	80 kW
Recommended Operating Range	285-475 bpd	45,31-75,52 m³/day		High Strength (S10)	122 hp	90 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	136 hp	100 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

272 SERIES PUMPS

Az ESPHS 272-510

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 4850 rpm



ENGINEERING DATA

@ 4850 rpm

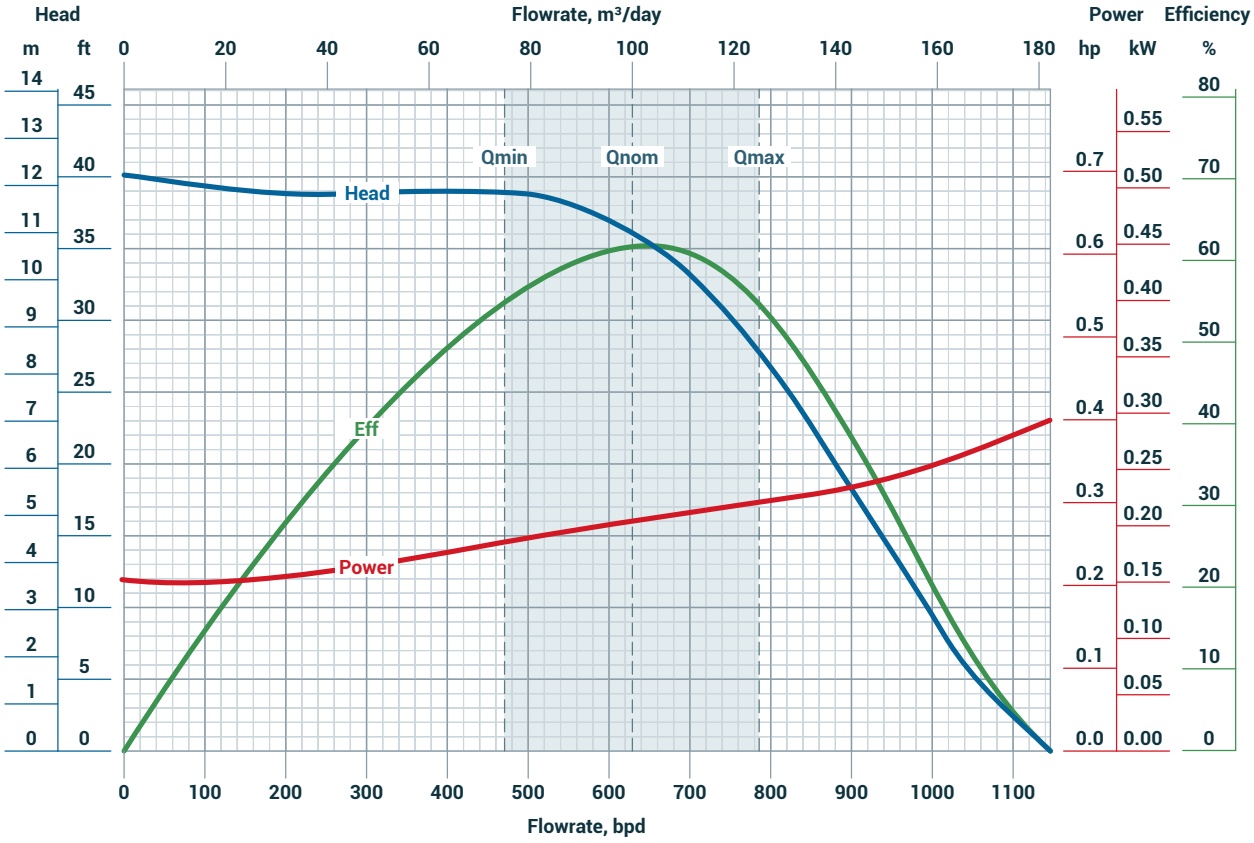
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	91 hp	67 kW
Recommended Operating Range	382-638 bpd	60,73-101,43 m³/day		High Strength (S10)	102 hp	75 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	113,5 hp	83,5 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

272 SERIES PUMPS

Az ESPHS 272-630

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 5820 rpm



ENGINEERING DATA

@ 5820 rpm

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	109 hp	80 kW
Recommended Operating Range	472-788 bpd	75,04-125,28 m³/day		High Strength (S10)	122 hp	90 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	136 hp	100 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

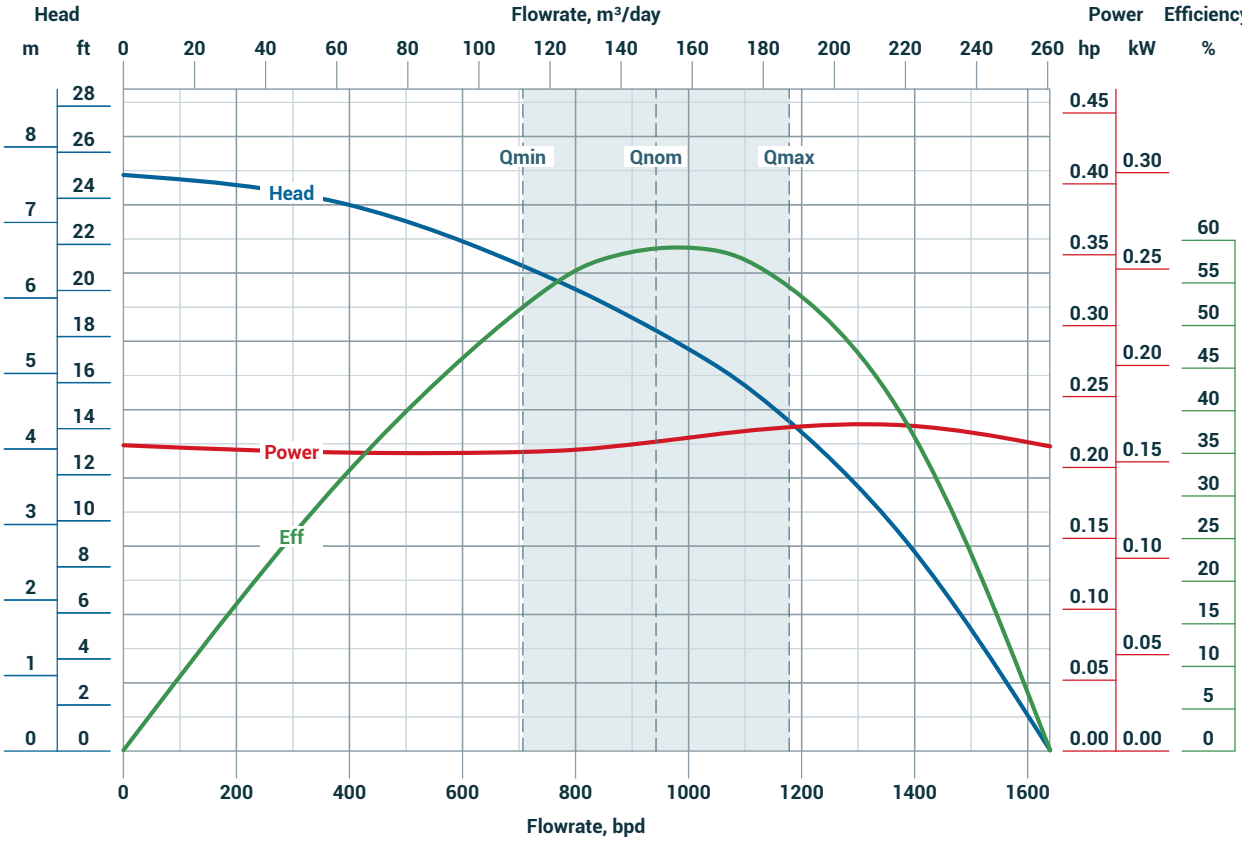
CONTENTS

272 SERIES PUMPS

Az ESPHS 272-950

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 4360 rpm



ENGINEERING DATA

@ 4360 rpm

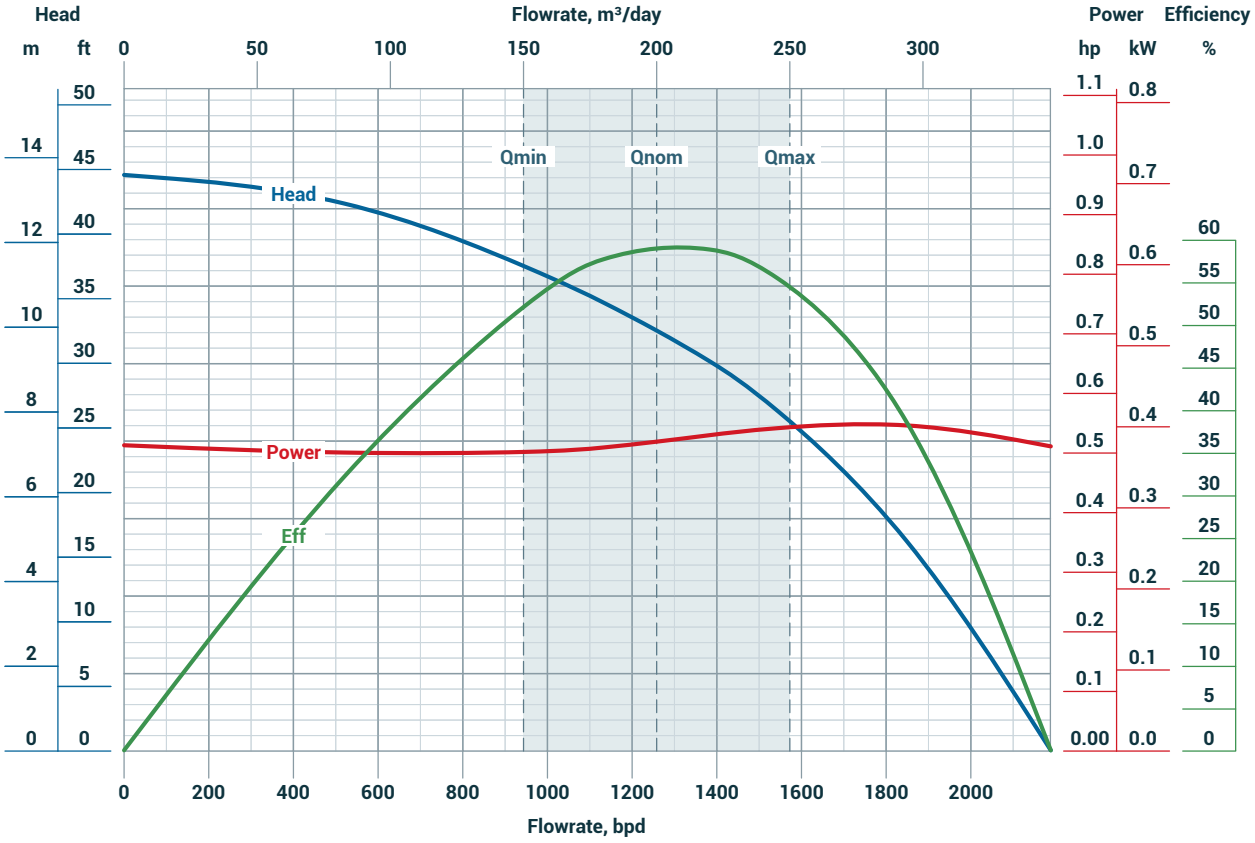
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	81,6 hp	60 kW
Recommended Operating Range	712-1188 bpd	113,2-188,88 m³/day		High Strength (S10)	92 hp	67,5 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	102 hp	75 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

272 SERIES PUMPS

Az ESPHS 272-1260

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 5820 rpm



ENGINEERING DATA

@ 5820 rpm

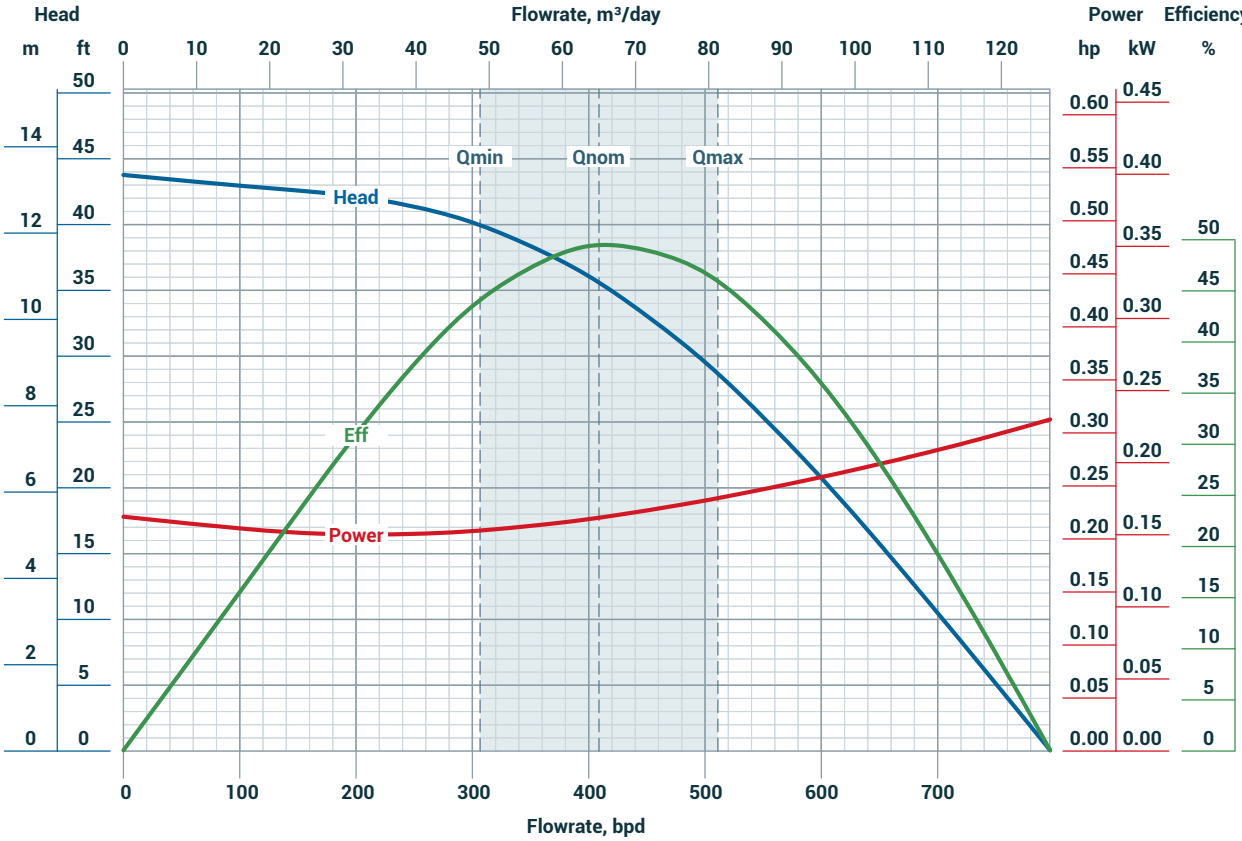
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,4 in	86,6 mm	Rotational Direction		CW	
Housing Diameter	2,72 in	69 mm	Shaft Power Limit	Standard (S9)	109 hp	80 kW
Recommended Operating Range	945-1575 bpd	150,24-250,4 m³/day		High Strength (S10)	122 hp	90 kW
Shaft Diameter	0,5 in	12,8 mm		Ultra High Strength (S11)	136 hp	100 kW
Shaft Cross Sectional Area	0,2 in²	128,7 mm²	Housing Burst Pressure Limit		5482 psi	378 bar

319 SERIES PUMPS

Az ESPHS 319-420

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 4850 rpm



ENGINEERING DATA

@ 4850 rpm

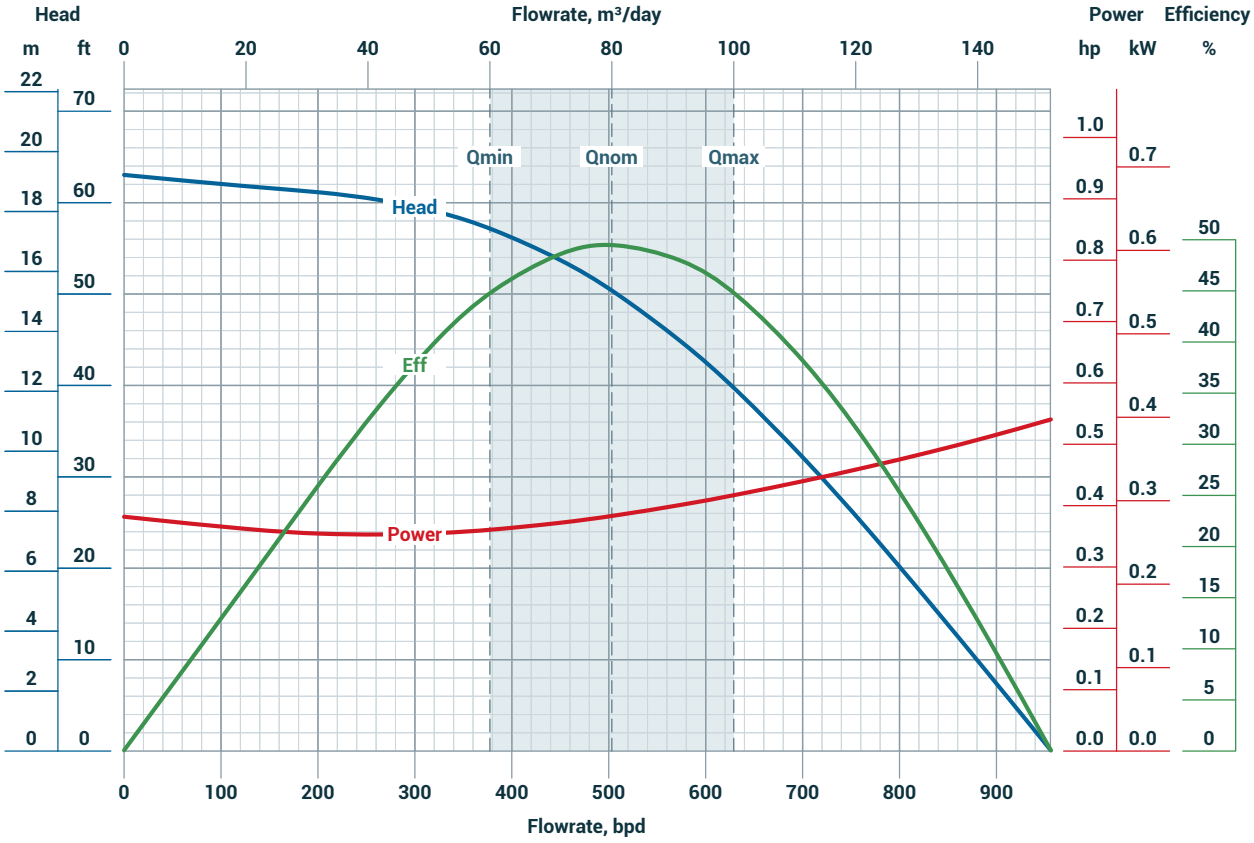
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,64 in	92,5 mm	Rotational Direction		CW	
Housing Diameter	3,18 in	81 mm	Shaft Power Limit	Standard (S9)	91 hp	67 kW
Recommended Operating Range	315-525 bpd	48,75-81,25 m³/day		High Strength (S10)	102 hp	75 kW
Shaft Diameter	0,55 in	14 mm		Ultra High Strength (S11)	113,5 hp	83,5 kW
Shaft Cross Sectional Area	0,24 in²	154 mm²	Housing Burst Pressure Limit		5323 psi	367 bar

319 SERIES PUMPS

Az ESPHS 319-510

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 5820 rpm



ENGINEERING DATA

@ 5820 rpm

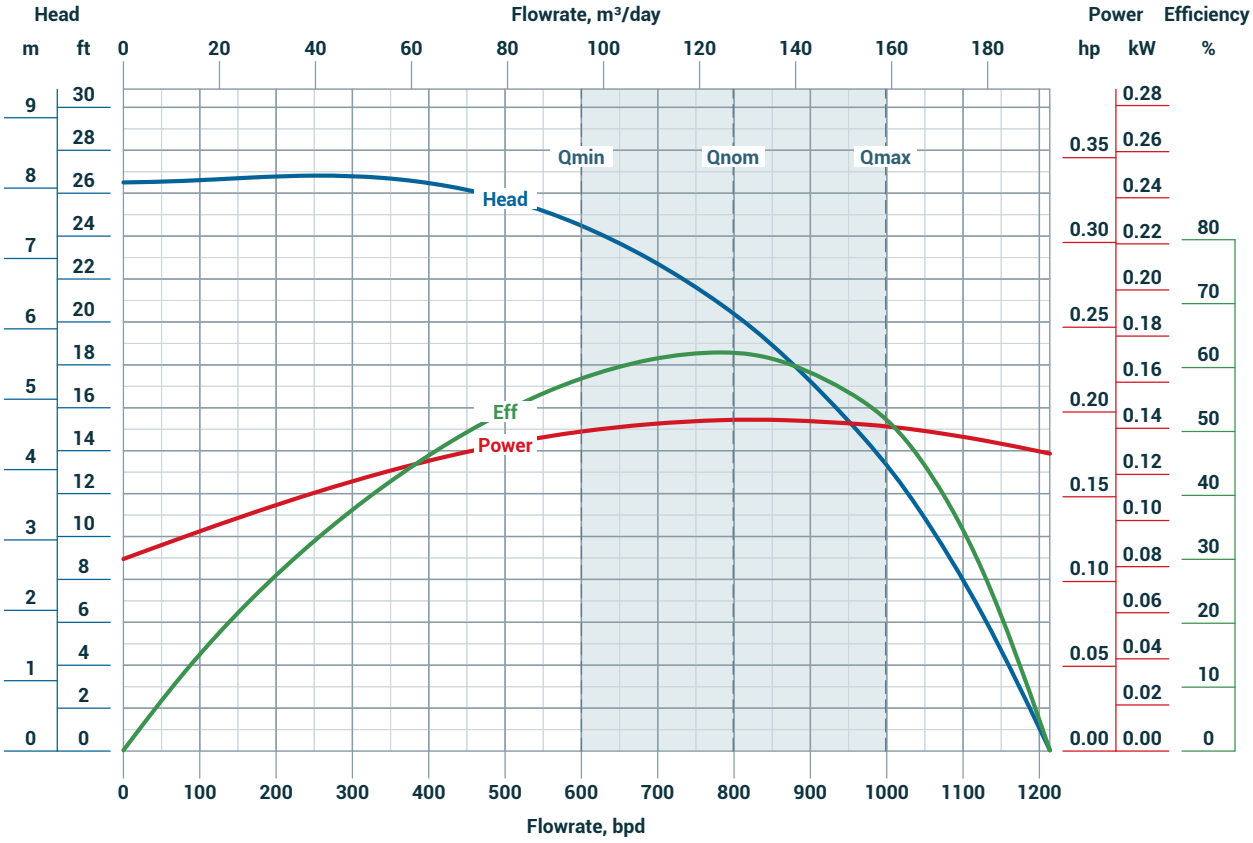
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,64 in	92,5 mm	Rotational Direction		CW	
Housing Diameter	3,18 in	81 mm	Shaft Power Limit	Standard (S9)	109 hp	80 kW
Recommended Operating Range	382-638 bpd	60-100 m³/day		High Strength (S10)	122 hp	90 kW
Shaft Diameter	0,55 in	14 mm		Ultra High Strength (S11)	136 hp	100 kW
Shaft Cross Sectional Area	0,24 in²	154 mm²	Housing Burst Pressure Limit		5323 psi	367 bar

319 SERIES PUMPS

Az ESPHS 319-800

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 4040 rpm



ENGINEERING DATA

@ 4040 RPM

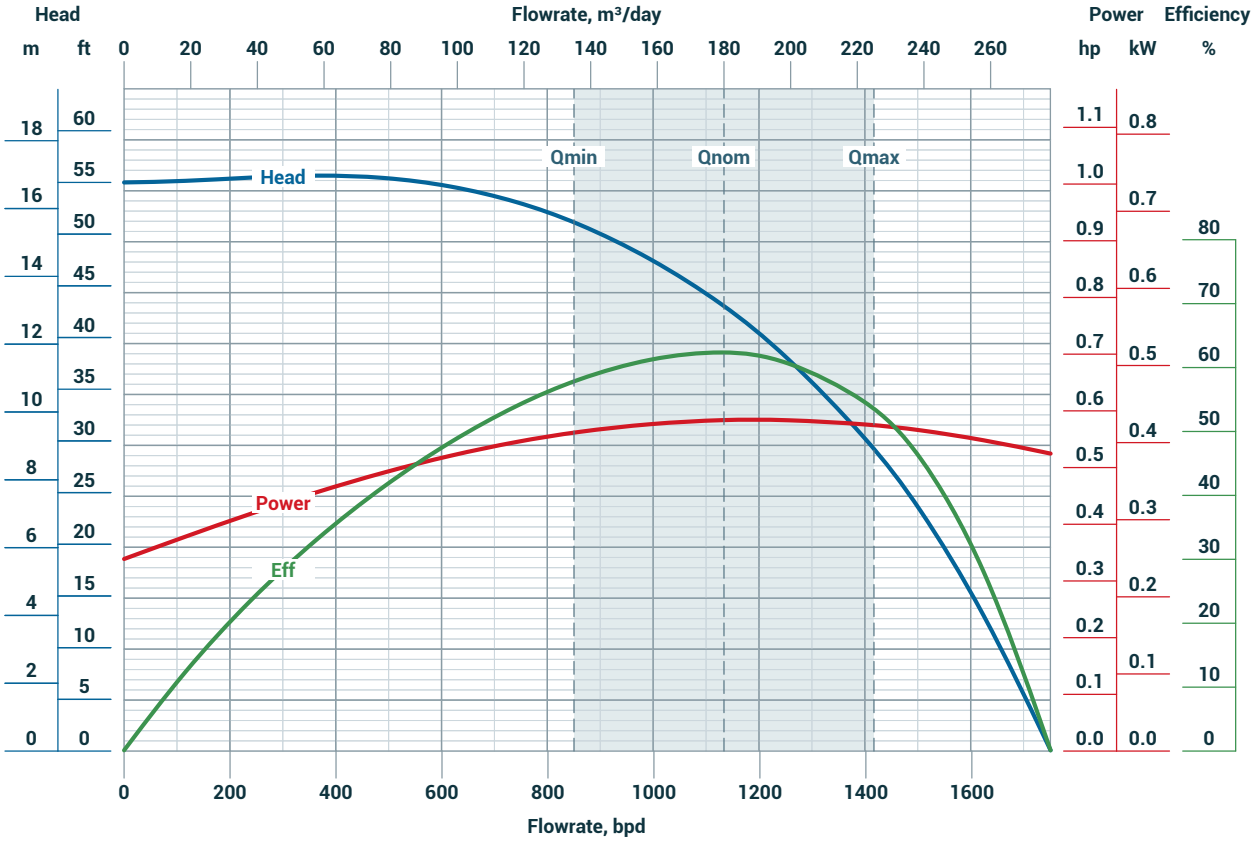
Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,64 in	92,5 mm	Rotational Direction		CW	
Housing Diameter	3,18 in	81 mm	Shaft Power Limit	Standard (S9)	75,6 hp	55,6 kW
Recommended Operating Range	600-1000 bpd	95,4-159 m³/day		High Strength (S10)	85 hp	62,5 kW
Shaft Diameter	0,55 in	14 mm		Ultra High Strength (S11)	94,5 hp	69,5 kW
Shaft Cross Sectional Area	0,24 in²	154 mm²	Housing Burst Pressure Limit		5323 psi	367 bar

319 SERIES PUMPS

Az ESPHS 319-1150

PUMP PERFORMANCE CURVE

1 STAGE IN 1.00 S.G. FLUID @ 5820 rpm



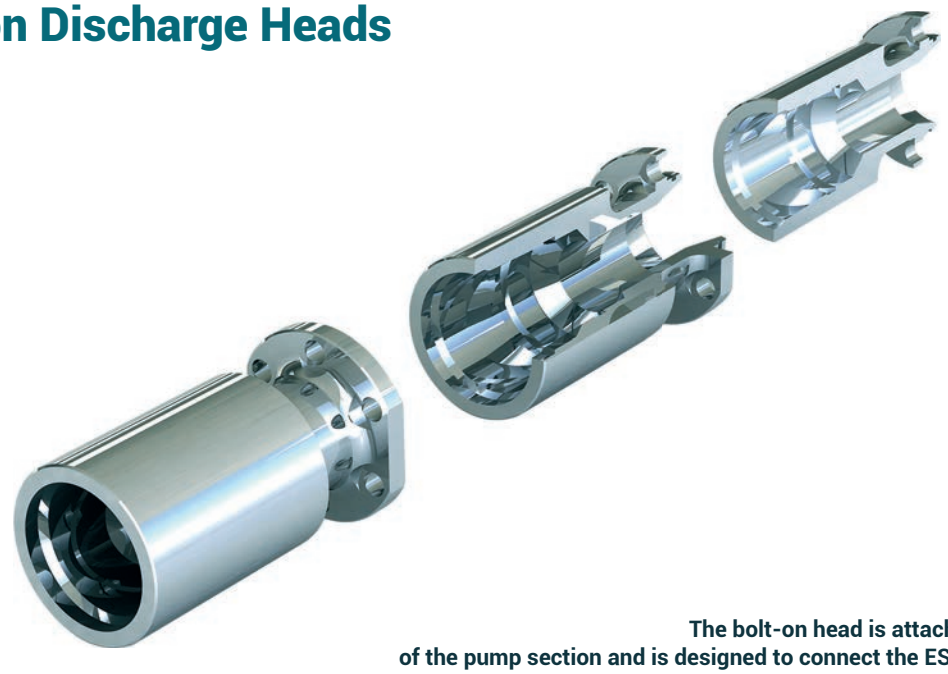
ENGINEERING DATA

@ 5820 RPM

Maximal ESP System OD (incl. MLE AWG#6, 4kV)	3,64 in	92,5 mm	Rotational Direction		CW	
Housing Diameter	3,18 in	81 mm	Shaft Power Limit	Standard (S9)	109 hp	80 kW
Recommended Operating Range	862-1438 bpd	137,05-228,62 m³/day		High Strength (S10)	122 hp	90 kW
Shaft Diameter	0,55 in	14 mm		Ultra High Strength (S11)	136 hp	100 kW
Shaft Cross Sectional Area	0,24 in²	154 mm²	Housing Burst Pressure Limit		5323 psi	367 bar

PUMP ACCESSORIES /

Bolt-on Discharge Heads



The bolt-on head is attached to the head of the pump section and is designed to connect the ESP to the tubing

EXAMPLE

Az BOH 362 2-7/8 8RD EUE SS

Az	BOH	362	2-7/8	8RD	EUE	SS
1	2	3	4	5	6	7

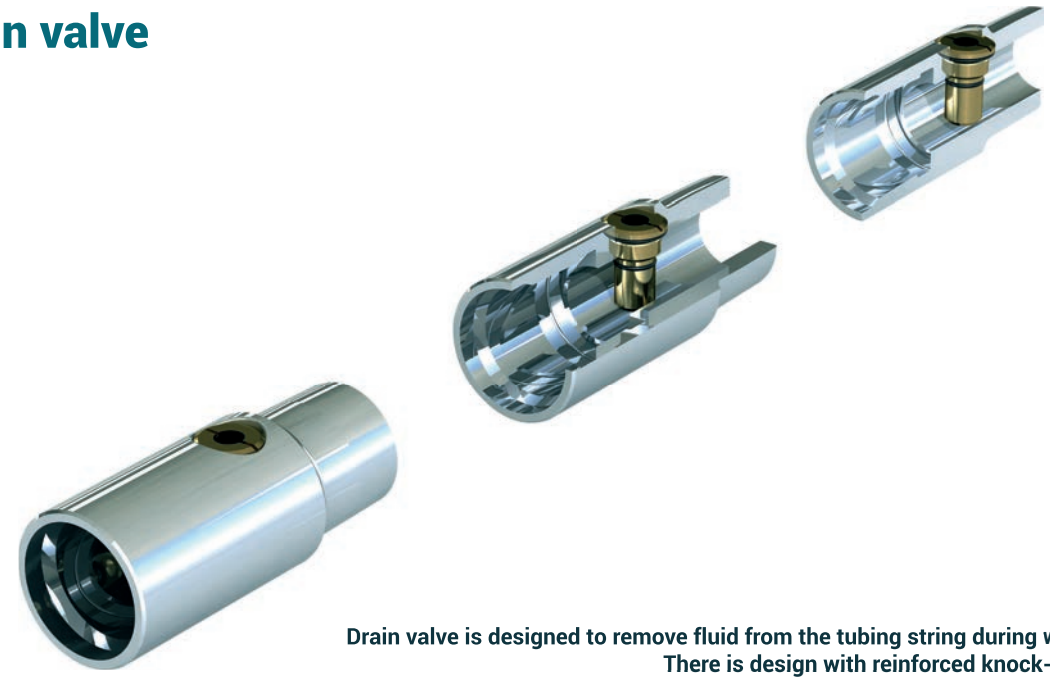
1	Manufacturer ALMAZ Production Company
2	Bolt-on discharge heads
3	Pump series
4	Thread size, inches: 1.900 in = 48 mm 2-3/8 in = 60 mm 2-7/8 in = 73 mm 3-1/2 in = 89 mm
5	Pitch, threads per inch: 10 – 10 threads per inch 8 – 8 threads per inch RD - round thread
6	Thread type: EUE - External upset ends NUE - Non upset ends
7	Material: SS – stainless steel No code – carbon steel

BOLT-ON DISCHARGE HEADS / Specification /

Description	Housing diameter		Length		Weight	
	in.	mm	ft	mm	lb	kg
Az BOH 272 1.900 10RD EUE	2,72	69	0,52	160	4,72	2,14
Az BOH 272 1.900 10RD NUE						
Az BOH 272 1.900 10RD EUE SS	2,72	69	0,52	160	4,25	1,93
Az BOH 272 1.900 10RD NUE SS						
Az BOH 362 2-7/8 8RD EUE	3,62	92	0,63	192	9,7	4,4
Az BOH 362 2-7/8 10RD NUE						
Az BOH 362 2-7/8 8RD EUE SS	3,62	92	0,63	192	9,26	4,2
Az BOH 362 2-7/8 10RD NUE SS						
Az BOH 406 2-7/8 8RD EUE	4,06	103	0,63	192	13,45	6,1
Az BOH 406 2-7/8 10RD NUE						
Az BOH 406 2-7/8 8RD EUE SS	4,06	103	0,63	192	13,01	5,9
Az BOH 406 2-7/8 10RD NUE SS						
Az BOH 406 3-1/2 8RD EUE	4,06	103	0,63	192	11,02	5
Az BOH 406 3-1/2 10RD NUE						
Az BOH 406 3-1/2 8RD EUE SS	4,06	103	0,63	192	10,58	4,8
Az BOH 406 3-1/2 10RD NUE SS						
Az BOH 446 3-1/2 8RD EUE	4,46	114	0,63	192	15,65	7,1
Az BOH 446 3-1/2 10RD NUE						
Az BOH 446 3-1/2 8RD EUE SS	4,46	114	0,63	192	15,21	6,9
Az BOH 446 3-1/2 10RD NUE SS						

PUMP ACCESSORIES / Valves /

Drain valve



Drain valve is designed to remove fluid from the tubing string during well repair
There is design with reinforced knock-off choke

EXAMPLE

Az DV 2-7/8 8RD EUE SS

Az	DV	2-7/8	8RD	EUE	SS
1	2	3	4	5	6

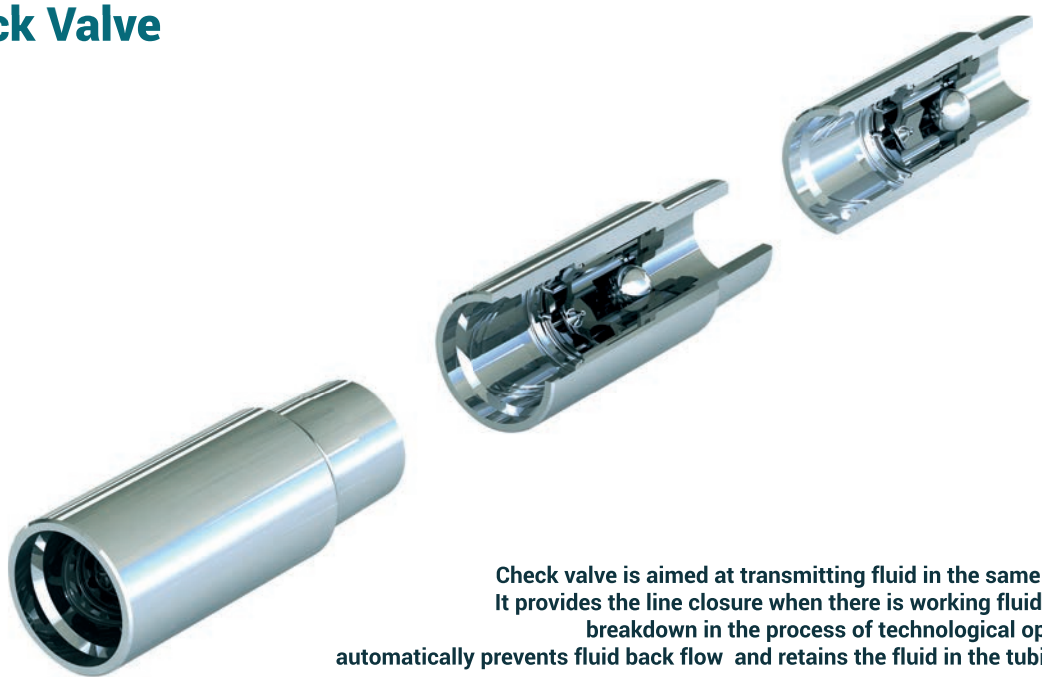
1	Manufacturer ALMAZ Production Company
2	DV - Drain Valve DVF - Drain Valve Fortified (drain fitting fortified)
3	Thread size, inches: 1.900 in = 48 mm 2-3/8 in = 60 mm 2-7/8 in = 73 mm 3-1/2 in = 89 mm
4	Pitch, threads per inch: 10 – 10 threads per inch 8 – 8 threads per inch RD - round thread
5	Thread type: EUE - External upset ends NUE - Non upset ends
6	Material: SS – stainless steel No code – carbon steel

BOLT-ON DISCHARGE HEADS / Specification /

Description	Housing diameter		Length		Weight	
	in.	mm	ft	mm	lb	kg
Az DV 1.900 10RD NUE	2,28	58	0,46	140	3,26	1,48
Az DV 1.900 10RD EUE						
Az DV 1.900 10RD NUE SS	2,28	58	0,46	140	3,26	1,48
Az DV 1.900 10RD EUE SS						
Az DV 2-3/8 10RD NUE	2,87	73	0,525	160	5,51	2,5
Az DV 2-3/8 8RD EUE						
Az DV 2-3/8 10RD NUE SS	2,87	73	0,525	160	5,51	2,5
Az DV 2-3/8 8RD EUE SS						
Az DV 2-7/8 10RD NUE	3,5	89	0,59	180	7,72	3,5
Az DV 2-7/8 8RD EUE						
Az DV 2-7/8 10RD NUE SS	3,5	89	0,59	180	7,72	3,5
Az DV 2-7/8 8RD EUE SS						
Az DV 3-1/2 10RD NUE	4,25	108	0,72	220	15	6,8
Az DV 3-1/2 8RD EUE						
Az DV 3-1/2 10RD NUE SS	4,25	108	0,72	220	15	6,8
Az DV 3-1/2 8RD EUE SS						
Az DVF 1.900 10RD NUE	2,28	58	0,46	140	3,26	1,48
Az DVF 1.900 10RD EUE						
Az DVF 1.900 10RD NUE SS	2,28	58	0,46	140	3,26	1,48
Az DVF 1.900 10RD EUE SS						
Az DVF 2-3/8 10RD NUE	2,87	73	0,525	160	5,51	2,5
Az DVF 2-3/8 8RD EUE						
Az DVF 2-3/8 10RD NUE SS	2,87	73	0,525	160	5,51	2,5
Az DVF 2-3/8 8RD EUE SS						
Az DVF 2-7/8 10RD NUE	3,5	89	0,59	180	7,72	3,5
Az DVF 2-7/8 8RD EUE						
Az DVF 2-7/8 10RD NUE SS	3,5	89	0,59	180	7,72	3,5
Az DVF 2-7/8 8RD EUE SS						
Az DVF 3-1/2 10RD NUE	4,25	108	0,72	220	15	6,8
Az DVF 3-1/2 8RD EUE						
Az DVF 3-1/2 10RD NUE SS	4,25	108	0,72	220	15	6,8
Az DVF 3-1/2 8RD EUE SS						

PUMP ACCESSORIES / Valves /

Check Valve



Check valve is aimed at transmitting fluid in the same direction
It provides the line closure when there is working fluid pressure breakdown in the process of technological operations, automatically prevents fluid back flow and retains the fluid in the tubing string

EXAMPLE

Az CV 2-7/8 8RD EUE 5030 SS

Az	CV	2-7/8	8RD	EUE	5030	SS
1	2	3	4	5	6	7

1	Manufacturer ALMAZ Production Company
2	CV - Check Valve CVS - Check Valve spring-loaded
3	Thread size, inches: 1.900 in = 48 mm 2-3/8 in = 60 mm 2-7/8 in = 73 mm 3-1/2 in = 89 mm
4	Pitch, threads per inch: 10 – 10 threads per inch 8 – 8 threads per inch RD - round thread
5	Thread type: EUE - External upset ends NUE - Non upset ends
6	Max capacity, bpd, (see Table 2)
7	Material: SS – stainless steel No code – carbon steel

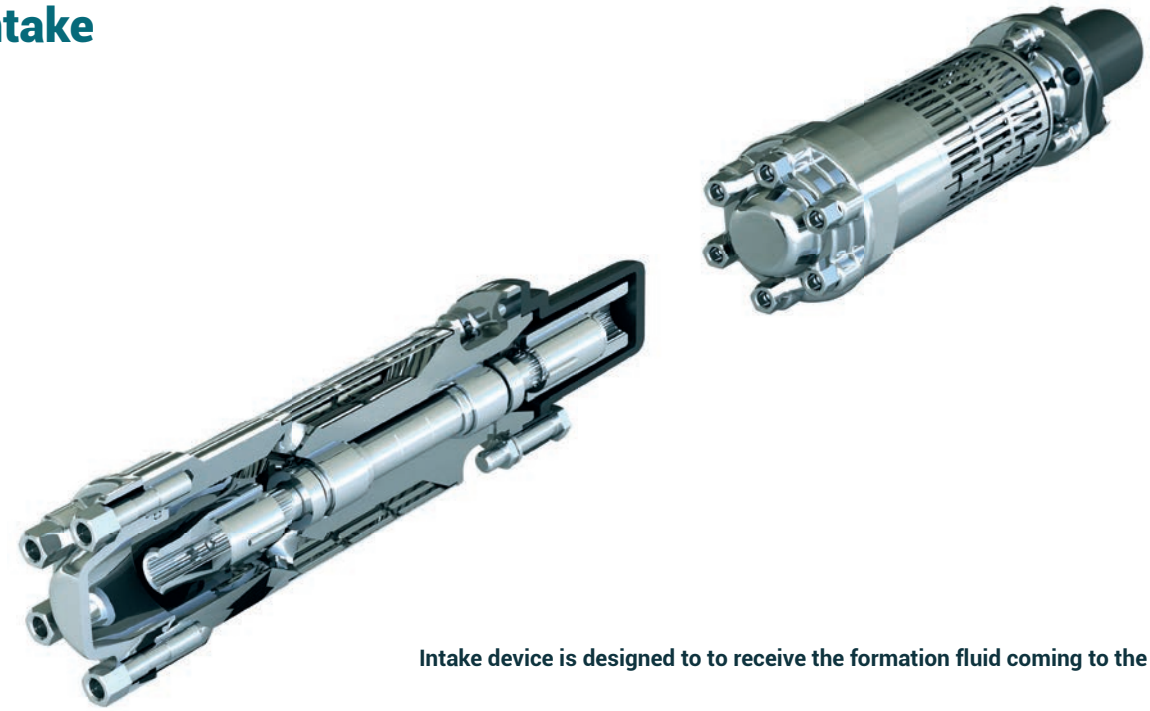
Table 2 - Max capacity

bpd	m³/day
780	125
1570	250
5030	800
7860	1250

CHECK VALVE / Specification /

Description	Housing diameter		Length		Weight	
	in.	mm	ft	mm	lb	kg
Az CV 1.900 10RD NUE 780	2,28	58	0,51	155	3,73	1,69
Az CV 1.900 10RD EUE 780						
Az CV 1.900 10RD NUE 780 SS	2,28	58	0,51	155	3,66	1,66
Az CV 1.900 10RD EUE 780 SS						
Az CV 2-3/8 10RD NUE 1570	2,87	73	0,62	190	7,28	3,3
Az CV 2-3/8 8RD EUE 1570						
Az CV 2-3/8 10RD NUE 1570 SS	2,87	73	0,62	190	7,05	3,2
Az CV 2-3/8 8RD EUE 1570 SS						
Az CV 2-7/8 10RD NUE 5030	3,5	89	0,82	250	14,55	6,6
Az CV 2-7/8 8RD EUE 5030						
Az CV 2-7/8 10RD NUE 5030 SS	3,5	89	0,82	250	14,33	6,5
Az CV 2-7/8 8RD EUE 5030 SS						
Az CV 2-7/8 10RD NUE 7860	3,5	89	0,82	250	13,82	6,27
Az CV 2-7/8 8RD EUE 7860						
Az CV 2-7/8 10RD NUE 7860 SS	3,5	89	0,82	250	13,58	6,16
Az CV 2-7/8 8RD EUE 7860 SS						
Az CV 3-1/2 10RD NUE 7860	4,25	108	0,89	270	21,83	9,9
Az CV 3-1/2 8RD EUE 7860						
Az CV 3-1/2 10RD NUE 7860 SS	4,25	108	0,89	270	21,61	9,8
Az CV 3-1/2 8RD EUE 7860 SS						
Az CVS 1.900 10RD NUE 780	2,28	58	0,56	170	4,32	1,96
Az CVS 1.900 10RD EUE 780						
Az CVS 1.900 10RD NUE 780 SS	2,28	58	0,56	170	4,19	1,9
Az CVS 1.900 10RD EUE 780 SS						
Az CVS 2-3/8 10RD NUE 1570	2,87	73	0,71	216	8,82	4
Az CVS 2-3/8 8RD EUE 1570						
Az CVS 2-3/8 10RD NUE 1570 SS	2,87	73	0,71	216	8,6	3,9
Az CVS 2-3/8 8RD EUE 1570 SS						
Az CVS 2-7/8 10RD NUE 5030	3,5	89	0,82	250	14,26	6,47
Az CVS 2-7/8 8RD EUE 5030						
Az CVS 2-7/8 10RD NUE 5030 SS	3,5	89	0,82	250	14,11	6,4
Az CVS 2-7/8 8RD EUE 5030 SS						
Az CVS 3-1/2 10RD NUE 7860	4,25	108	0,89	270	22,93	10,4
Az CVS 3-1/2 8RD EUE 7860						
Az CVS 3-1/2 10RD NUE 7860 SS	4,25	108	0,89	270	22,71	10,3
Az CVS 3-1/2 8RD EUE 7860 SS						

Intake



Intake device is designed to to receive the formation fluid coming to the ESP

EXAMPLE

Az INT 406 0.98 M CR2 MS

Az	INT	406	0.98	M	CR2	MS
1	2	3	4	5	6	7

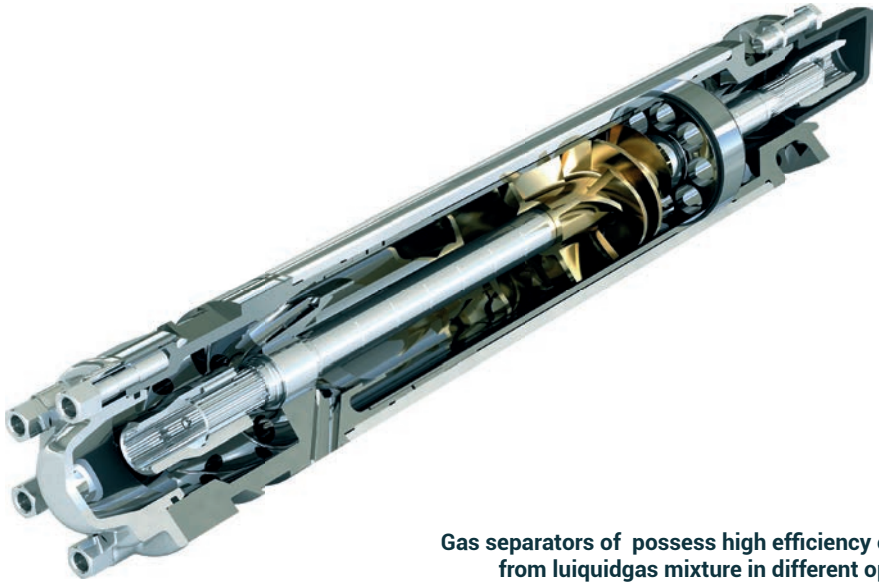
1	Manufacturer ALMAZ Production Company
2	INT – intake
3	Intake series
4	Shaft diameter, inches
5	Shaft material: No code – Stainless steel M – MONEL K-500
6	Corrosion resistance design: CR0 – stainless steel head and base, carbon steel housing, carbon steel fasteners CR2 – stainless steel head, base and housing, monel fasteners
7	No code – standart housing MS – housing for Motor Shroud

INTAKE / Specification /

Description	Housing diameter		Shaft		Installation Length (with standart base)		Weight	
	in.	mm	in.	mm	ft	mm	lb	kg
Az INT 272 0.55	2,72	69	0,55	14	0,76	232	12,1	5,5
Az INT 319 0.67	3,19	81	0,67	17	0,81	247	17,2	7,8
Az INT 362 0.79	3,62	92	0,79	20	0,94	287	22,3	10,1
Az INT 406 0.87	4,06	103	0,87	22	0,94	287	25,8	11,7
Az INT 406 0.98	4,06	103	0,98	25	0,94	287	26,9	12,2
Az INT 449 1.18	4,49	114	1,18	30	0,94	287	38,1	17,3

Intakes, Gas and Solids Handling Devices

Gas Separators



Gas separators of possess high efficiency of gas separation from luiquidgas mixture in different operational modes
They are recommended for operations in wells, complicated by high values of non-assosiated gas (up to 75% by volume at intake) and by carrying out abrasive solid particles at a concentraton up to 1 g/l of formation fluid

EXAMPLE

Az GS V 406 1570 M CR1

Az	GS	V	406	1570	M	CR1	MS
1	2	3	4	5	6	7	8

1	Manufacturer ALMAZ Production Company
2	GS - Gas separator
3	Gas Separator type: V – vortex R – rotary
4	Gas separator series
5	Nominal capacity, bpd @60Hz
6	Shaft material: No code – Stainless steel M – MONEL K-500
7	Corrosion resistance design: CR0 – stainless steel head and base, carbon steel housing, carbon steel fasteners CR1 – stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating),monel fasteners CR2 – stainless steel head, base and housing, monel fasteners
8	No code – standart base MS - base for Motor Shroud

VORTEX GAS SEPARATORS / Specification /

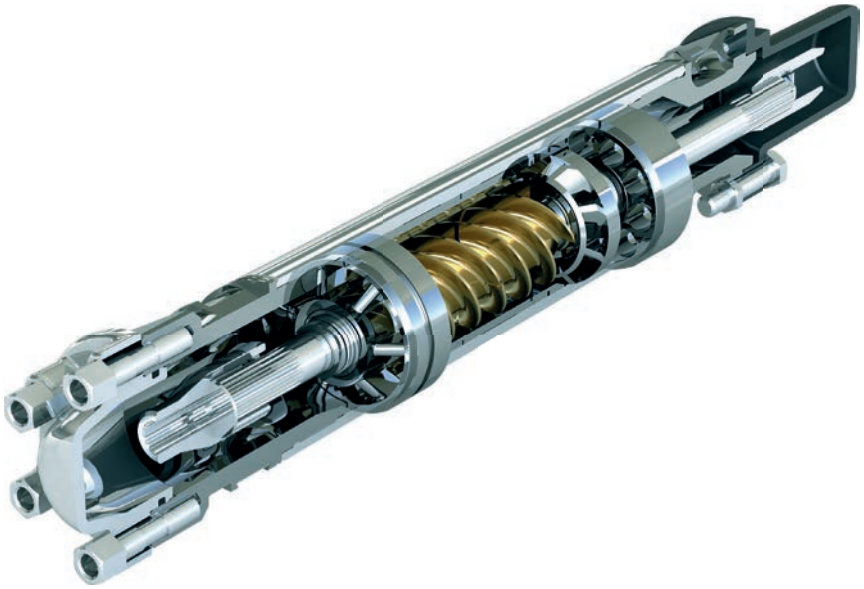
Description	Nominal capacity		Housing diameter		Shaft		Installation Length (with standart base)		Weight	
	bpd 60 Hz	m³/day 50 Hz	in.	mm	in.	mm	ft	mm	lb	kg
Az GS V 272 750	750	100	2,72	69	0,55	14	2,09	638	26,9	12,2
Az GS V 362 1900	1900	250	3,62	92	0,79	20	2,34	712	48,5	22
Az GS V 406 1900	1900	250	3,62	92	0,87	22	2,34	712	50,93	23,1
Az GS V 406 3800	3800	500	4,06	103	0,87	22	2,48	757	61,7	28
Az GS V 406 6050	6050	800	4,06	103	0,98	25	2,48	757	62,8	28,5
Az GS V 449 7550	7550	1000	4,49	114	1,18	30	2,75	838	93,3	42,3
Az GS V 449 9400	9400	1250	4,49	114	1,18	30	2,75	838	93,3	42,3
Az GS R 362 1900	1900	250	3,62	92	0,79	20	2,34	712	48,5	22
Az GS R 406 1900	1900	250	3,62	92	0,87	22	2,34	712	50,93	23,1
Az GS R 406 3800	3800	500	4,06	103	0,87	22	2,48	757	61,7	28
Az GS R 406 6050	6050	800	4,06	103	0,98	25	2,48	757	62,8	28,5

ROTARY GAS SEPARATORS / Specification /

Description	Nominal capacity		Housing diameter		Shaft		Installation Length (with standart base)		Weight	
	bpd 60 Hz	m³/day 50 Hz	in.	mm	in.	mm	ft	mm	lb	kg
Az GS R 362 1900	1900	250	3,62	92	0,79	20	2,34	712	48,5	22
Az GS R 406 1900	1900	250	3,62	92	0,87	22	2,34	712	50,93	23,1
Az GS R 406 3800	3800	500	4,06	103	0,87	22	2,48	757	61,7	28
Az GS R 406 6050	6050	800	4,06	103	0,98	25	2,48	757	62,8	28,5

Intakes, Gas and Solids Handling Devices

Advanced Gas Handler



EXAMPLE

Az AGH 406 1900 M CR1 MS

Az	AGH	406	1900	M	CR1	MS
1	2	3	4	5	6	7

1	Manufacturer ALMAZ Production Company
2	AGH - Advanced Gas Handler
3	AGH series
4	Nominal capacity, bpd @60Hz
5	Shaft material: No code – Stainless steel M – MONEL K-500
6	Corrosion resistance design: CR0 – stainless steel head and base, carbon steel housing, carbon steel fasteners CR1 – stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating),monel fasteners CR2 – stainless steel head, base and housing, monel fasteners
7	No code – standart base MS - base for Motor Shroud

ADVANCED GAS HANDLER / Specification /

Description	Nominal capacity		Housing diameter		Shaft		Installation Length (with standart base)		Weight	
	bpd 60 Hz	m³/day 50 Hz	in.	mm	in.	mm	ft	mm	lb	kg
Az AGH 362 1900	1900	250	3,62	92	0,79	20	1,86	566	40,3	18,3
Az AGH 406 1900	1900	250	3,62	92	0,87	22	1,86	566	41,9	19
Az AGH 406 3800	3800	500	4,06	103	0,87	22	2,14	651	56,9	25,8
Az AGH 406 6050	6050	800	4,06	103	0,98	25	2,14	651	61,7	28

Intakes, Gas and Solids Handling Devices

Gas separator-Handler

EXAMPLE

Az GSH V 406 1900 M CR1 MS

Az	GSH	V	406	1900	M	CR1	MS
1	2	3	4	5	6	7	8

1	Manufacturer ALMAZ Production Company
2	GSH - Gas separator-Handler
3	Gas Separator type: V – vortex R – rotary
4	GSH series
5	Nominal capacity, bpd @60Hz
6	Shaft material: No code – Stainless steel M – MONEL K-500
7	Corrosion resistance design: CR0 – stainless steel head and base, carbon steel housing, carbon steel fasteners CR1 – stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating),monel fasteners CR2 – stainless steel head, base and housing, monel fasteners
8	No code – standart base MS - base for Motor Shroud

VORTEX SEPARATOR-HANDLER / Specification /

Description	Nominal capacity		Housing diameter		Shaft		Installation Length (with standart base)		Weight	
	bpd 60 Hz	m³/day 50 Hz	in.	mm	in.	mm	ft	mm	lb	kg
Az GSH V 272 750	750	100	2,72	69	0,55	14	2,81	856	37	16,8
Az GSH V 319 1150	1150	150	3,19	81	0,67	17	3,29	1002	59,5	27
Az GSH V 362 750	750	100	3,62	92	0,79	20	3,29	1002	70,6	32
Az GSH V 362 1900	1900	250	3,62	92	0,79	20	3,29	1002	67,2	30,5
Az GSH V 406 1900	1900	250	3,62	92	0,87	22	3,29	1002	72,8	33
Az GSH V 406 3800	3800	500	4,06	103	0,87	22	3,54	1079	84,9	38,5
Az GSH V 406 6050	6050	800	4,06	103	0,98	25	3,54	1079	89,3	40,5
Az GSH V 449 9400	9400	1250	4,49	114	1,18	30	3,77	1150	127,2	57,7

ROTARY SEPARATOR-HANDLER / Specification /

Description	Nominal capacity		Housing diameter		Shaft		Installation Length (with standart base)		Weight	
	bpd 60 Hz	m³/day 50 Hz	in.	mm	in.	mm	ft	mm	lb	kg
Az GSH R 362 1900	1900	250	3,62	92	0,79	20	3,29	1002	67,2	30,5
Az GSH R 406 1900	1900	250	3,62	92	0,87	22	3,29	1002	72,8	33
Az GSH R 406 3800	3800	500	4,06	103	0,87	22	3,54	1079	84,9	38,5
Az GSH R 406 6050	6050	800	4,06	103	0,98	25	3,54	1079	89,3	40,5

PUMP ACCESSORIES

SandTrapper

SandTrapper device is designed for check valve and ESP from contamination that can be inside tubing string and is deposited during pump mounting and operation.

EXAMPLE

Az STH 2-7/8 8RD EUE 10 5030 SS

Az	STH	2-7/8	8RD	EUE	10	5030	SS
1	2	3	4	5	6	7	8

1	Manufacturer ALMAZ Production Company
2	ST - Sand Trap STH - Sand Trap with housing
3	Tubing size, inches: 1.900 in = 48 mm 2-3/8 in = 60 mm 2-7/8 in = 73 mm 3-1/2 in = 89 mm
4	Pitch, threads per inch: No code – standart (without housing) 10 – 10 threads per inch 8 – 8 threads per inch RD - round thread
5	Thread type: No code – standart (without housing) EUE - External upset ends NUE - Non upset ends
6	Length of the sand trap, ft (see Table 2)
7	Max capacity, bpd, (see Table 3)
8	Material: SS – stainless steel No code – carbon steel

SANDTRAPPER / Specification /

Description	Housing diameter		Flange diameter		Weight	
	in.	mm	in.	mm	lb	kg
Az ST 1.900 5 780	–	–	1,65	42	5,95	2,7
Az ST 1.900 10 780	–	–	1,65	42	11,24	5,1
Az ST 1.900 5 780 SS	–	–	1,65	42	5,73	2,6
Az ST 1.900 10 780 SS	–	–	1,65	42	11,24	5,1
Az STH 1.900 10RD NUE 5 780	2,28	58	–	–	8,16	3,7
Az STH 1.900 10RD EUE 5 780	2,28	58	–	–	8,16	3,7
Az STH 1.900 10RD NUE 5 780 SS	2,28	58	–	–	7,94	3,6
Az STH 1.900 10RD EUE 5 780 SS	2,28	58	–	–	7,94	3,6
Az STH 1.900 10RD NUE 10 780	2,28	58	–	–	13,67	6,2
Az STH 1.900 10RD EUE 10 780	2,28	58	–	–	13,67	6,2
Az STH 1.900 10RD NUE 10 780 SS	2,28	58	–	–	13,45	6,1
Az STH 1.900 10RD EUE 10 780 SS	2,28	58	–	–	13,45	6,1
Az ST 2-3/8 5 1570	–	–	2,13	54	13	5,9
Az ST 2-3/8 10 1570	–	–	2,13	54	13,67	6,2
Az ST 2-3/8 5 1570 SS	–	–	2,13	54	12,79	5,8
Az ST 2-3/8 10 1570 SS	–	–	2,13	54	13,45	6,1
Az ST 2-7/8 5 5030	–	–	2,6	66	15,21	6,9
Az ST 2-7/8 10 5030	–	–	2,6	66	29,32	13,3
Az ST 2-7/8 5 5030 SS	–	–	2,6	66	14,99	6,8
Az ST 2-7/8 10 5030 SS	–	–	2,6	66	29,1	13,2
Az STH 2-7/8 10RD NUE 5 5030	3,54	90	–	–	19,4	8,8
Az STH 2-7/8 8RD EUE 5 5030	3,54	90	–	–	19,4	8,8
Az STH 2-7/8 10RD NUE 5 5030 SS	3,54	90	–	–	19,18	8,7
Az STH 2-7/8 8RD EUE 5 5030 SS	3,54	90	–	–	19,18	8,7
Az STH 2-7/8 10RD NUE 10 5030	3,54	90	–	–	30,2	13,7
Az STH 2-7/8 8RD EUE 10 5030	3,54	90	–	–	30,2	13,7
Az STH 2-7/8 10RD NUE 10 5030 SS	3,54	90	–	–	29,98	13,6
Az STH 2-7/8 8RD EUE 10 5030 SS	3,54	90	–	–	29,98	13,6
Az ST 3-1/2 5 7860	–	–	3,2	81	23,8	10,8
Az ST 3-1/2 10 7860	–	–	3,2	81	13	5,9
Az ST 3-1/2 5 7860 SS	–	–	3,2	81	23,59	10,7
Az ST 3-1/2 10 7860 SS	–	–	3,2	81	12,79	5,8
Az STH 3-1/2 10RD NUE 5 7860	4,25	108	–	–	33,73	15,3
Az STH 3-1/2 8RD EUE 5 7860	4,25	108	–	–	33,73	15,3
Az STH 3-1/2 10RD NUE 5 7860 SS	4,25	108	–	–	33,51	15,2
Az STH 3-1/2 8RD EUE 5 7860 SS	4,25	108	–	–	33,51	15,2
Az STH 3-1/2 10RD NUE 10 7860	4,25	108	–	–	56	25,4
Az STH 3-1/2 8RD EUE 10 7860	4,25	108	–	–	56	25,4
Az STH 3-1/2 10RD NUE 10 7860 SS	4,25	108	–	–	55,78	25,3
Az STH 3-1/2 8RD EUE 10 7860 SS	4,25	108	–	–	55,78	25,3

MOTOR PROTECTORS

Protectors

The protector is designed to protect the inner cavity of the electric motor from the ingress of formation fluid, to compensate for changes in the volume of oil, to transfer torque from the shaft of the electric motor to the shaft of the input module
Certain versions of protectors can also transmit torque to the ESP shaft (double-sided installation)

EXAMPLE

Az MP 362 BBSLL 272H/319B I HT CR0 S9

Az	MP	362	BBSLL	272H/319B	I	HT	CR0	S9
1	2	3	4	5	6	7	8	9

1	Manufacturer ALMAZ Production Company
2	No code - Standard design M - Modular Protector
3	Series (see Table 1)
4	B - Elastomer bag BB - Two elastomer bag S - shaft seals L - Labyrinth LL - Two labyrinth
5	No code - Standard design XXXH - Head series (for intake device connection) XXXB - Base series (for motor connection)
6	Shaft: No code - Standard shaft diameter I - Increased shaft diameter
7	Heat resistance: No code - Standard. Ambient temperature - up to 248 °F (120 °C) HT - High Temperature. Ambient temperature - up to 302 °F (150 °C) UHT - Ultra High Temperature. Ambient temperature - up to 338 °F (170 °C)
8	Corrosion resistance: CR0 - carbon steel housing, head and base, fasteners CR1 - stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating), monel fasteners
9	Shaft material strength (see Table 2)

PROTECTOR / Table /

Table 1 - Series		
Series	Housing diameter, in.	Housing diameter, mm
272	2,72	69
319	3,19	81
338	3,38	86
362	3,62	92
406	4,06	103
449	4,49	114

Table 2 - Shaft material strength					
Material strength	Material yield strength, MPa	Shaft diameter		Shaft BHP limit	
		in	mm	kW @ 50Hz	hp @ 60Hz
M8 - MONEL K-500 I8 - Inconel alloy	785	0,551	14	35	57,1
		0,787	20	90	146,8
		0,984	25	240	391,6
		1,102	28	335	546,6
		1,378	35	705	1150,2
S9 - Stainless steel I9 - Inconel alloy	880	0,551	14	40	65,3
		0,787	20	100	163,2
		0,984	25	270	440,5
		1,102	28	367	598,8
		1,378	35	790	1288,9
S10 - Stainless steel I10 - Inconel alloy	980	0,551	14	45	73,4
		0,787	20	110	179,5
		0,984	25	300	489,5
		1,102	28	400	652,6
		1,378	35	880	1435,7
S11 - Stainless steel	1080	0,551	14	50	81,6
		0,787	20	120	195,8
		0,984	25	330	538,4
		1,102	28	431	703,2
		1,378	35	970	1582,6

PROTECTOR / Specification /

Design data on protector 272 series (OD 69 mm)											
Description	Shaft diameter		Thrust bearing load limit		Maximum motor power		Oil volume	Installation length		Mass	
	in	mm	kg 50Hz	lb 60Hz	kW 50Hz	hp 60Hz	l	mm	ft	kg	lb
AzMP272 BBSLL	0,551	14	360	952	50	81,6	3,3	2082	6,9	34	75
AzMP272 BBSLL 272H/319B										35	77
AzMP272 BBSBB										34	75
AzMP272 BBSBB 272H/319B										35	77

Design data on protector 319 series (OD 81 mm)											
Description	Shaft diameter		Thrust bearing load limit		Maximum motor power		Oil volume	Installation length		Mass	
	in	mm	kg 50Hz	lb 60Hz	kW 50Hz	hp 60Hz	l	mm	ft	kg	lb
AzMP319 B	0,787	20	560	1481	120	195,8	2,3	1058	3,5	27	60
AzMP319 BSB							4,5	1650	5,4	39	86

Design data on protector 338 series (OD 86 mm)											
Description	Shaft diameter		Thrust bearing load limit		Maximum motor power		Oil volume	Installation length		Mass	
	in	mm	kg 50Hz	lb 60Hz	kW 50Hz	hp 60Hz	l	mm	ft	kg	lb
AzMP338 BBSLL I	0,984	25	650	1720	150	244,7	6	2675	8,8	72	159

Design data on protector 362 series (OD 92 mm)											
Description	Shaft diameter		Thrust bearing load limit		Maximum motor power		Oil volume	Installation length		Mass	
	in	mm	kg 50Hz	lb 60Hz	kW 50Hz	hp 60Hz	l	mm	ft	kg	lb
AzP362 BSL	0,984	25	750	1984	270	440,5	7,4	2451	8,1	68	150
AzMP362 BSL	0,984	25	750	1984	36	58,7	4	1648	5,4	53	117
AzMP362 BBSL	0,984	25	750	1984	90	146,8	5,6	2195	7,2	68	150
AzMP362 BBSLL	0,984	25	750	1984	125	203,9	7,4	2742	9,0	83	183
AzMP362 BBSBBSL	0,984	25	750	1984	125	203,9	8,6	3312	10,9	99	218

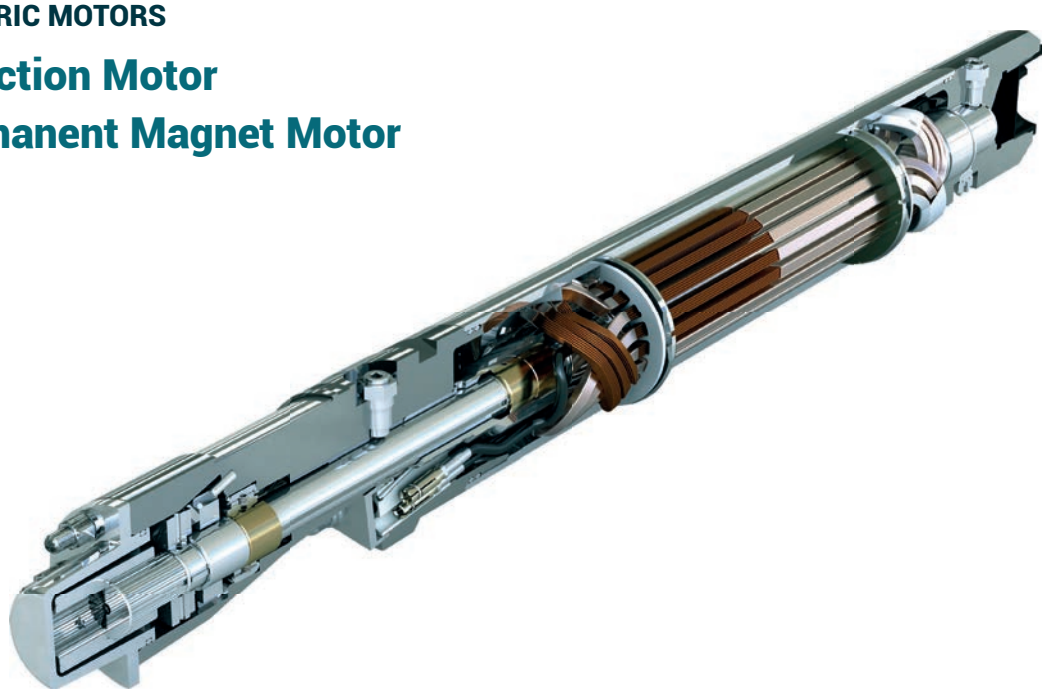
PROTECTOR / Specification /

Design data on protector 406 series (OD 103 mm)											
Description	Shaft diameter		Thrust bearing load limit		Maximum motor power		Oil volume	Installation length		Mass	
	in	mm	kg 50Hz	lb 60Hz	kW 50Hz	hp 60Hz	l	mm	ft	kg	lb
AzMP406 BBSLL	0,984	25	950	2513	200	326,3	7,5	2742	9,0	86	190
AzMP406 BBSLL I	1,102	28	950	2513	360	587,3	10,1	2737	9,0	97	214
AzMP406 BBSBBSL	0,984	25	950	2513	270	440,5	8,7	3312	10,9	102	225
AzMP406 BBSBBSL I	1,102	28	950	2513	360	587,3	11,9	3307	10,9	116	256

Design data on protector 449 series (OD 114 mm)											
Description	Shaft diameter		Thrust bearing load limit		Maximum motor power		Oil volume	Installation length		Mass	
	in	mm	kg 50Hz	lb 60Hz	kW 50Hz	hp 60Hz	l	mm	ft	kg	lb
AzP449 BSL I	1,378	35	1200	3175	640	1044,2	11,5	2451	8,1	102	225
AzMP449 BSB 406H/512B	1,102	28	1200	3175	45	73,4	5,6	1634	5,4	67	148
AzMP449 BBSLL 406H/512B	1,102	28	1200	3175	480	783,1	10,2	2737	9,0	103	227
AzMP449 BBSLL	1,102	28	1200	3175	450	734,2	10,2	2707	8,9	103	227
AzMP449 BBSLL 449H/460B	1,102	28	950	2513	360	587,3	10,2	2707	8,9	98	216
AzMP449 BBSLL 449H/460B	1,102	28	1200	3175	480	783,1	10,2	2707	8,9	102	225
AzMP449 BBSLL 406H/460B	1,102	28	1200	3175	480	783,1	10,2	2737	9,0	101	223

ELECTRIC MOTORS

Induction Motor
Permanent Magnet Motor



EXAMPLE

Az 406 IM 182 H 4000V 30A DBL M HT CR1

Az	406	IM	182	H	4000V	30A	DBL	M	HT	CR1
1	2	3	4	5	6	7	8	9	10	11

1	Manufacturer ALMAZ Production Company
2	Series
3	IM - Induction Motor PMM - Permanent Magnet Motor
4	Power, hp @60Hz
5	Type voltage (only IM): No code – Standard H - High-voltage
6	Nominal voltage, V @60Hz
7	Nominal current, A
8	Single and Tandem motors: SGL - Single motor UT - Upper tandem DBL - Double motor CT - Center tandem TRP - Triple motor LT - Lower tandem
9	Shaft material: No code – Stainless steel M – MONEL K-500
10	Heat resistance: No code - Standard. Ambient temperature - up to 248 °F (120 °C) HT - High Temperature. Ambient temperature - up to 302 °F (150 °C) UHT - Ultra High Temperature. Ambient temperature - up to 338 °F (170 °C)
11	Corrosion resistance design: CR0 – carbon steel housing, head and base, fasteners CR1 – stainless steel head and base, carbon steel housing with anti-corrosion coating (super stainless flame coating),monel fasteners CR2 – stainless steel head, base and housing, monel fasteners

INDUCTION MOTOR / Specification /

Design data on asynchronous motor 406 series (OD 103 mm) SGL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az406IM26 670V 25A SGL	16	26	560	670	25	0,05	0,16	3059	10,1	168	370
Az406IM33 780V 27A SGL	20	33	650	780	27	0,06	0,20	3406	11,2	190	419
Az406IM36 870V 26A SGL	22	36	730	870	26	0,07	0,23	3753	12,4	211	465
Az406IM39 900V 28A SGL	24	39	750	900	28	0,07	0,23	3753	12,4	211	465
Az406IM46 1020V 29A SGL	28	46	850	1020	29	0,09	0,30	4100	13,5	232	511
Az406IM52 1140V 32A SGL	32	52	950	1140	32	0,10	0,33	4447	14,7	253	558
Az406IM59 1260V 32A SGL	36	59	1050	1260	32	0,11	0,36	4794	15,8	274	604
Az406IM65 1380V 32A SGL	40	65	1150	1380	32	0,13	0,43	5141	17,0	296	653
Az406IM73 1580V 32A SGL	45	73	1320	1580	32	0,14	0,46	5835	19,3	338	745
Az406IM82 1700V 32A SGL	50	82	1420	1700	32	0,16	0,52	6182	20,4	359	791
Az406IM91 1840V 34A SGL	56	91	1540	1840	34	0,18	0,59	6529	21,5	380	838
Az406IM103 2060V 34A SGL	63	103	1720	2060	34	0,21	0,69	7223	23,8	423	933
Az406IM114 2280V 34A SGL	70	114	1900	2280	34	0,23	0,75	7917	26,1	486	1071
Az406IM131 2400V 37A SGL	80	131	2000	2400	37	0,26	0,85	8611	28,4	508	1120

Design data on asynchronous double motor 460 series (OD 117 mm) SGL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az460IM26 870V 19A SGL	16	26	730	870	19	0,05	0,16	2316	7,6	150	331
Az460IM33 800V 26,5A SGL	20	33	670	800	26,5	0,06	0,20	2696	8,9	178	392
Az460IM36 940V 25A SGL	22	36	790	940	25	0,07	0,23	3076	10,2	207	456
Az460IM39 970V 26A SGL	24	39	810	970	26	0,07	0,23	3076	10,2	207	456
Az460IM42 1080V 26A SGL	26	42	900	1080	26	0,08	0,26	3456	11,4	235	518
Az460IM46 1140V 26A SGL	28	46	950	1140	26	0,09	0,30	3456	11,4	235	518
Az460IM52 1300V 27A SGL	32	52	1090	1300	27	0,10	0,33	3836	12,7	264	582
Az460IM59 1470V 26A SGL	36	59	1230	1470	26	0,11	0,36	4216	13,9	292	644
Az460IM65 1630V 26A SGL	40	65	1360	1630	26	0,13	0,43	4596	15,2	321	708
Az460IM73 1680V 27A SGL	45	73	1400	1680	27	0,14	0,46	4976	16,4	349	769
Az460IM82 1800V 30A SGL	50	82	1500	1800	30	0,16	0,52	5356	17,7	378	833
Az460IM91 1920V 30A SGL	56	91	1600	1920	30	0,18	0,59	5736	18,9	406	895
Az460IM103 2400V 30A SGL	63	103	2000	2400	30	0,21	0,69	6496	21,4	463	1021
Az460IM114 2400V 30A SGL	70	114	2000	2400	30	0,23	0,75	6876	22,7	492	1085
Az460IM131 2640V 32A SGL	80	131	2200	2640	32	0,26	0,85	7256	23,9	520	1146
Az460IM147 2130V 44A SGL	90	147	1780	2130	44	0,30	0,98	7636	25,2	549	1210
Az460IM163 2400V 40A SGL	100	163	2000	2400	40	0,33	1,08	8396	27,7	606	1336
Az460IM179 2610V 44,5A SGL	110	179	2180	2610	44,5	0,37	1,21	9156	30,2	663	1462
Az460IM204 2640V 50A SGL	125	204	2200	2640	50	0,42	1,38	9156	30,2	663	1462
Az460IM228 2760V 53A SGL	140	228	2300	2760	53	0,46	1,51	9156	30,2	663	1462

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Design data on asynchronous double motor 512 series (OD 130 mm) SGL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az512IM29 1080V 18,5A SGL	18	29	900	1080	18,5	0,06	0,20	1763	5,8	160	353
Az512IM46 1320V 23,5A SGL	28	46	1100	1320	23,5	0,07	0,23	2258	7,5	202	445
Az512IM52 1140V 29A SGL	32	52	950	1140	29	0,10	0,33	2258	7,5	202	445
Az512IM59 1360V 27A SGL	36	59	1140	1360	27	0,12	0,39	2258	7,5	202	445
Az512IM65 1740V 24A SGL	40	65	1450	1740	24	0,14	0,46	2753	9,1	244	538
Az512IM91 1740V 33A SGL	56	91	1450	1740	33	0,18	0,59	3248	10,7	286	631
Az512IM103 2280V 29A SGL	63	103	1900	2280	29	0,21	0,69	3743	12,4	328	723
Az512IM114 1980V 34,5A SGL	70	114	1650	1980	34,5	0,23	0,75	3743	12,4	328	723
Az512IM131 2280V 34A SGL	80	131	1900	2280	34	0,26	0,85	4238	14,0	370	816
Az512IM147 2040V 42A SGL	90	147	1700	2040	42	0,30	0,98	4733	15,6	412	908
Az512IM163 2280V 41,5A SGL	100	163	1900	2280	41,5	0,33	1,08	5228	17,3	454	1001
Az512IM179 2520V 41,5A SGL	110	179	2100	2520	41,5	0,36	1,18	5723	18,9	496	1093
Az512IM204 2400V 50A SGL	125	204	2000	2400	50	0,42	1,38	6218	20,5	538	1186
Az512IM228 2400V 55A SGL	140	228	2000	2400	55	0,47	1,54	6713	22,2	580	1279
Az512IM245 2520V 57,5A SGL	150	245	2100	2520	57,5	0,50	1,64	7208	23,8	622	1371
Az512IM262 2880V 57A SGL	160	262	2400	2880	57	0,54	1,77	7703	25,4	664	1464
Az512IM294 3060V 56A SGL	180	294	2550	3060	56	0,54	1,77	8198	27,1	706	1556

Design data on asynchronous motor 406 series (OD 103 mm) DBL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az406IM146 3600V 42A DBL	90	146	1920	3600	42	0,28	0,92	11641	38,4	660	1455
Az406IM73 1800V 42A UT	45	73	960	1800				5843	19,3	332	732
Az406IM73 1800V 42A LT	45	73	960	1800				5798	19,1	328	723
Az406IM164 4080V 45A DBL	100	164	2100	4080	45	0,32	1,05	12335	40,7	702	1548
Az406IM82 2040V 45A UT	50	82	1050	2040				6190	20,4	353	778
Az406IM82 2040V 45A LT	50	82	1050	2040				6145	20,3	349	769
Az406IM206 3560V 48A DBL	125	206	2400	3560	48	0,42	1,38	14417	47,6	828	1825
Az406IM103 1780V 48A UT	63	103	1200	1780				7231	23,9	416	917
Az406IM103 1780V 48A LT	63	103	1200	1780				7186	23,7	412	908
Az406IM228 4000V 56A DBL	140	228	2300	4000	56	0,46	1,51	15805	52,2	914	2015
Az406IM114 2000V 56A UT	70	114	1150	2000				7925	26,2	459	1012
Az406IM114 2000V 56A LT	70	114	1150	2000				7880	26,0	455	1003
Az406IM262 3980V 57A DBL	160	262	2600	3980	57	0,52	1,71	17193	56,7	998	2200
Az406IM131 1990V 57A UT	80	131	1300	1990				8619	28,4	501	1105
Az406IM131 1990V 57A LT	80	131	1300	1990				8574	28,3	497	1096

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Design data on asynchronous motor 406 series (OD 103 mm) TRP											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az406IM306 3000V 68A TRP	180	306	2500	3000	43	0,28	0,92	21611	71,3	1246	2747
Az406IM102 990V 68A UT	63	102	833	990				7231	23,9	416	917
Az406IM102 990V 68A CT	63	102	833	990				7194	23,7	418	922
Az406IM102 990V 68A LT	63	102	833	990				7186	23,7	412	908
Az406IM342 3360V 70A TRP	210	342	2800	3360	43	0,32	1,05	23693	78,2	1374	3029
Az406IM114 1110V 70A UT	70	114	933	1110				7925	26,2	459	1012
Az406IM114 1110V 70A CT	70	114	933	1110				7888	26,0	460	1014
Az406IM114 1110V 70A LT	70	114	933	1110				7880	26,0	455	1003

Design data on asynchronous motor 460 series (OD 117 mm) DBL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az460IM146 2220V 43A DBL	90	146	1850	2220	43	0,28	0,92	9052	29,9	640	1411
Az460IM73 1110V 43A UT	45	73	925	1110				4525	14,9	323	712
Az460IM73 1110V 43A LT	45	73	925	1110				4527	14,9	317	699
Az460IM164 2400V 43A DBL	100	164	2000	2400	43	0,32	1,05	9812	32,4	706	1556
Az460IM82 1200V 43A UT	50	82	1000	1200				4905	16,2	356	785
Az460IM82 1200V 43A LT	50	82	1000	1200				4907	16,2	350	772
Az460IM180 2240V 50A DBL	110	180	1870	2240	50	0,36	1,18	9812	32,4	706	1556
Az460IM90 1120V 50A UT	55	90	935	1120				4905	16,2	356	785
Az460IM90 1120V 50A LT	55	90	935	1120				4907	16,2	350	772
Az460IM206 2490V 51A DBL	125	206	2080	2490	51	0,42	1,38	10572	34,9	762	1680
Az460IM103 1240V 51A UT	63	103	1040	1240				5285	17,4	384	847
Az460IM103 1240V 51A LT	63	103	1040	1240				5287	17,4	378	833
Az460IM228 2850V 51A DBL	140	228	2380	2850	51	0,46	1,51	12092	39,9	876	1931
Az460IM114 1420V 51A UT	70	114	1190	1420				6045	19,9	441	972
Az460IM114 1420V 51A LT	70	114	1190	1420				6047	20,0	435	959
Az460IM262 2700V 61A DBL	160	262	2250	2700	61	0,52	1,71	13612	44,9	990	2183
Az460IM131 1350V 61A UT	80	131	1125	1350				6805	22,5	498	1098
Az460IM131 1350V 61A LT	80	131	1125	1350				6807	22,5	492	1085
Az460IM294 3040V 64A DBL	180	294	2540	3040	64	0,60	1,97	15132	49,9	1104	2434
Az460IM147 1520V 64A UT	90	147	1270	1520				7565	25,0	555	1224
Az460IM147 1520V 64A LT	90	147	1270	1520				7567	25,0	549	1210
Az460IM326 3240V 66A DBL	200	326	2700	3240	66	0,66	2,17	15892	52,4	1162	2562
Az460IM163 1620V 66A UT	100	163	1350	1620				7945	26,2	584	1287
Az460IM163 1620V 66A LT	100	163	1350	1620				7947	26,2	578	1274
Az460IM360 3480V 66A DBL	220	360	2900	3480	66	0,74	2,43	16652	55,0	1218	2685
Az460IM180 1740V 66A UT	110	180	1450	1740				8325	27,5	612	1349
Az460IM180 1740V 66A LT	110	180	1450	1740				8327	27,5	606	1336

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Design data on asynchronous motor 460 series (OD 117 mm) TRP											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az460IM408 3130V 84A TRP	250	408	2610	3130	43	0,66	2,17	19208	63,4	1401	3089
Az460IM136 1040V 84A UT	83	136	870	1040				6425	21,2	470	1036
Az460IM136 1040V 84A CT	83	136	870	1040				6356	21,0	467	1030
Az460IM136 1040V 84A LT	83	136	870	1040				6427	21,2	464	1023
Az460IM441 3360V 84A TRP	270	441	2800	3360	43	0,66	2,17	20925	69,1	1486	3276
Az460IM147 1110V 84A UT	90	147	933	1110				6805	22,5	498	1098
Az460IM147 1110V 84A CT	90	147	933	1110				6736	22,2	496	1093
Az460IM147 1110V 84A LT	90	147	933	1110				6807	22,5	492	1085
Az460IM456 3520V 84A TRP	280	456	2940	3520	43	0,84	2,76	22065	72,8	1572	3466
Az460IM152 1170V 84A UT	93	152	980	1170				7185	23,7	527	1162
Az460IM152 1170V 84A CT	93	152	980	1170				7116	23,5	524	1155
Az460IM152 1170V 84A LT	93	152	980	1170				7187	23,7	521	1149
Az460IM489 3780V 84A TRP	300	489	3150	3780	43	1,24	4,07	22628	74,7	1657	3653
Az460IM163 1260V 84A UT	100	163	1050	1260				7565	25,0	555	1224
Az460IM163 1260V 84A CT	100	163	1050	1260				7496	24,7	553	1219
Az460IM163 1260V 84A LT	100	163	1050	1260				7567	25,0	549	1210
Az460IM522 3960V 84A TRP	320	522	3300	3960	43	1,32	4,33	23768	78,4	1743	3843
Az460IM174 1320V 84A UT	107	174	1100	1320				7945	26,2	584	1287
Az460IM174 1320V 84A CT	107	174	1100	1320				7876	26,0	581	1281
Az460IM174 1320V 84A LT	107	174	1100	1320				7947	26,2	578	1274
Az460IM555 4320V 84A TRP	340	555	3600	4320	43	1,50	4,92	26625	87,9	1914	4220
Az460IM185 1440V 84A UT	113	185	1200	1440				8705	28,7	641	1413
Az460IM185 1440V 84A CT	113	185	1200	1440				8636	28,5	638	1407
Az460IM185 1440V 84A LT	113	185	1200	1440				8707	28,7	635	1400
Az460IM588 4560V 84A TRP	360	588	3800	4560	43	1,50	4,92	27188	89,7	1999	4407
Az460IM196 1520V 84A UT	120	196	1267	1520				9085	30,0	669	1475
Az460IM196 1520V 84A CT	120	196	1267	1520				9016	29,8	667	1470
Az460IM196 1520V 84A LT	120	196	1267	1520				9087	30,0	663	1462

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Design data on asynchronous motor 512 series (OD 130 mm) DBL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az512IM326 3120V 43A DBL	200	326	2600	3120	43	0,66	2,17	9383	31,0	1081	2383
Az512IM163 1560V 43A UT	100	163	1300	1560				4663	15,4	419	924
Az512IM163 1560V 43A LT	100	163	1300	1560				4720	15,6	410	904
Az512IM360 3480V 43A DBL	220	360	2900	3480	43	0,66	2,17	10373	34,2	913	2013
Az512IM180 1740V 43A UT	110	180	1450	1740				5158	17,0	461	1016
Az512IM180 1740V 43A LT	110	180	1450	1740				5215	17,2	452	996
Az512IM408 3240V 43A DBL	250	408	2700	3240	43	0,84	2,76	11249	37,1	1015	2238
Az512IM204 1620V 43A UT	125	204	1350	1620				5653	18,7	503	1109
Az512IM204 1620V 43A LT	125	204	1350	1620				5596	18,5	512	1129
Az512IM490 3240V 43A DBL	300	490	2700	3240	43	1,24	4,07	14333	47,3	1249	2754
Az512IM245 1620V 43A UT	150	245	1350	1620				7138	23,6	629	1387
Az512IM245 1620V 43A LT	150	245	1350	1620				7195	23,7	620	1367
Az512IM522 3780V 43A DBL	320	522	3150	3780	43	1,32	4,33	14333	47,3	1249	2754
Az512IM261 1890V 43A UT	160	261	1575	1890				7138	23,6	629	1387
Az512IM261 1890V 43A LT	160	261	1575	1890				7195	23,7	620	1367
Az512IM572 3810V 43A DBL	350	572	3180	3810	43	1,50	4,92	16313	53,8	1417	3124
Az512IM286 1900V 43A UT	175	286	1590	1900				8128	26,8	713	1572
Az512IM286 1900V 43A LT	175	286	1590	1900				8185	27,0	704	1552
Az512IM588 3840V 43A DBL	360	588	3200	3840	43	1,50	4,92	16313	53,8	1417	3124
Az512IM294 1920V 43A UT	180	294	1600	1920				8128	26,8	713	1572
Az512IM294 1920V 43A LT	180	294	1600	1920				8185	27,0	704	1552
Az512IM652 3600V 43A DBL	400	652	3000	3600	43	1,66	5,45	16313	53,8	1501	3309
Az512IM326 1800V 43A UT	200	326	1500	1800				8623	28,5	755	1664
Az512IM326 1800V 43A LT	200	326	1500	1800				8680	28,6	746	1645

Design data on asynchronous motor 512 series (OD 130 mm) TRP											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az512IM735 4572V 100A TRP	450	735	3810	4572	100	1,86	6,10	21458	70,8	1872	4127
Az512IM245 1524V 100A UT	150	245	1270	1524				7138	23,6	629	1387
Az512IM245 1524V 100A CT	150	245	1270	1524				7125	23,5	623	1373
Az512IM245 1524V 100A LT	150	245	1270	1524				7195	23,7	620	1367
Az512IM816 4250V 122A TRP	500	816	3550	4250	122	1,86	6,10	21458	70,8	1872	4127
Az512IM272 1420V 122A UT	167	272	1250	1420				7633	25,2	671	1479
Az512IM272 1420V 122A CT	167	272	1250	1420				7620	25,1	665	1466
Az512IM272 1420V 122A LT	167	272	1250	1420				7690	25,4	662	1459

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Design data on asynchronous motor 406 series (OD 103 mm) SGL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az406IM26 H2300V 7,5A SGL	16	26	1920	2300	7,5	0,05	0,16	3059	10,1	168	370
Az406IM33 H2760V 8A SGL	20	33	2300	2760	8	0,06	0,20	3406	11,2	190	419
Az406IM36 H3120V 8A SGL	22	36	2600	3120	8	0,07	0,23	3753	12,4	211	465
Az406IM39 H3430V 8A SGL	24	39	2860	3430	8	0,07	0,23	4100	13,5	232	511
Az406IM46 H3780V 8A SGL	28	46	3150	3780	8	0,09	0,30	4447	14,7	253	558
Az406IM52 H3480V 10A SGL	32	52	2900	3480	10	0,10	0,33	4794	15,8	274	604
Az406IM59 H3840V 10,5A SGL	36	59	3200	3840	10,5	0,11	0,36	5141	17,0	296	653
Az406IM65 H4080V 11A SGL	40	65	3400	4080	11	0,13	0,43	5488	18,1	317	699
Az406IM73 H3360V 15A SGL	45	73	2800	3360	15	0,14	0,46	5835	19,3	338	745
Az406IM82 H3600V 15A SGL	50	82	3000	3600	15	0,16	0,52	6182	20,4	359	791
Az406IM91 H3840V 16A SGL	56	91	3200	3840	16	0,18	0,59	6529	21,5	380	838
Az406IM103 H3600V 19A SGL	63	103	3000	3600	19	0,20	0,66	7223	23,8	423	933
Az406IM114 H3960V 20A SGL	70	114	3300	3960	20	0,22	0,72	7917	26,1	465	1025

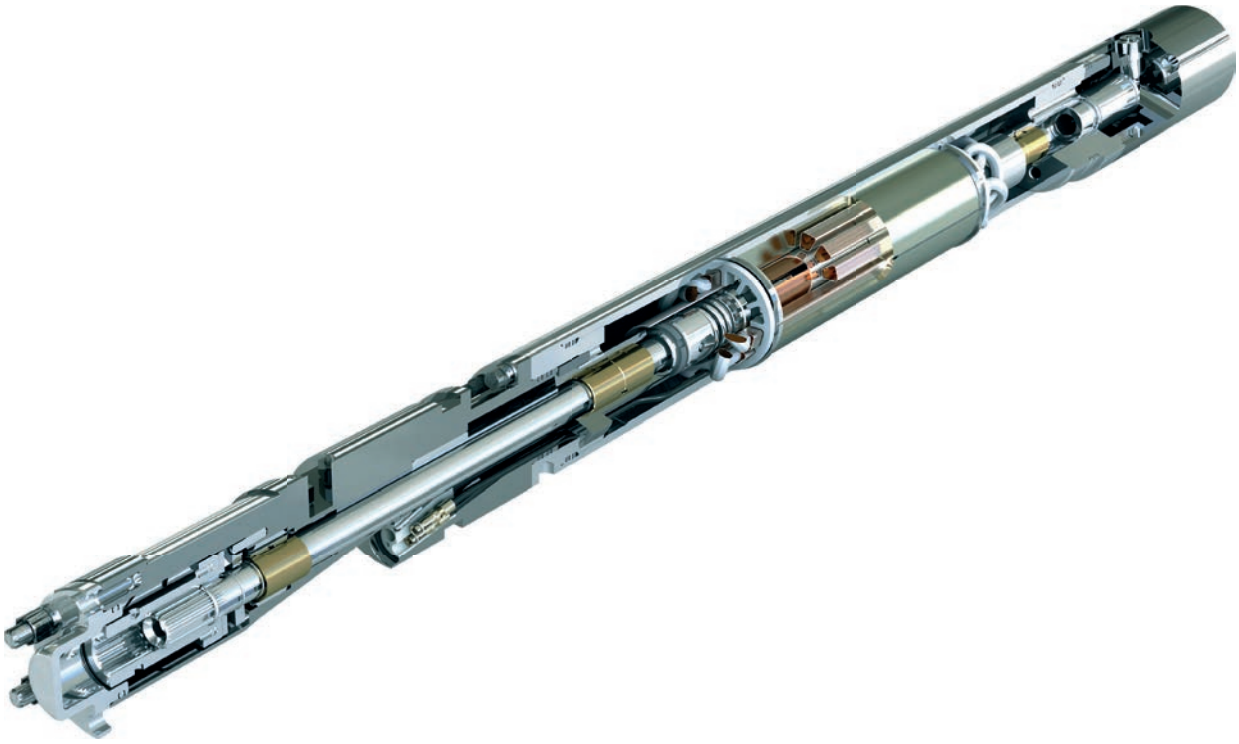
Design data on asynchronous double motor 460 series (OD 117 mm) SGL											
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az460IM26 H2200V 7,5A SGL	16	26	1830	2200	7,5	0,05	0,16	2316	7,6	150	331
Az460IM33 H2760V 7,5A SGL	20	33	2300	2760	7,5	0,06	0,20	2696	8,9	178	392
Az460IM36 H3120V 7,5A SGL	22	36	2600	3120	7,5	0,07	0,23	3076	10,2	207	456
Az460IM39 H2750V 9A SGL	24	39	2290	2750	9	0,07	0,23	3076	10,2	207	456
Az460IM46 H3190V 9A SGL	28	46	2660	3190	9	0,09	0,30	3456	11,4	235	518
Az460IM52 H2700V 12,5A SGL	32	52	2250	2700	12,5	0,10	0,33	3836	12,7	264	582
Az460IM59 H3020V 12,5A SGL	36	59	2520	3020	12,5	0,11	0,36	4216	13,9	292	644
Az460IM65 H2600V 16A SGL	40	65	2170	2600	16	0,13	0,43	4596	15,2	321	708
Az460IM73 H2880V 16A SGL	45	73	2400	2880	16	0,14	0,46	4976	16,4	349	769
Az460IM82 H3120V 16,5A SGL	50	82	2600	3120	16,5	0,16	0,52	5356	17,7	378	833
Az460IM91 H3550V 16,5A SGL	56	91	2960	3550	16,5	0,18	0,59	5736	18,9	406	895
Az460IM103 H3900V 17A SGL	63	103	3260	3900	17	0,21	0,69	6496	21,4	463	1021
Az460IM114 H3600V 20A SGL	70	114	3000	3600	20	0,23	0,75	6876	22,7	492	1085
Az460IM131 H3900V 21A SGL	80	131	3250	3900	21	0,26	0,85	7256	23,9	520	1146
Az460IM147 H3400V 27A SGL	90	147	2840	3400	27	0,30	0,98	7636	25,2	549	1210
Az460IM163 H3780V 27A SGL	100	163	3150	3780	27	0,33	1,08	8396	27,7	606	1336
Az460IM179 H4150V 27A SGL	110	179	3460	4150	27	0,37	1,21	9156	30,2	663	1462

INDUCTION MOTOR / Specification /

Design data on asynchronous motor 406 series (OD 103 mm) DBL										
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az406IM131 H3600V 24A DBL	80	131	3000	3600	24	0,26	0,85	10253	33,8	576	1270
Az406IM65 H1800V 24A UT	40	65	1500	1800				5149	17,0	290	639
Az406IM65 H1800V 24A LT	40	65	1500	1800				5104	16,8	286	631
Az406IM147 H4080V 24A DBL	90	147	3400	4080	24	0,28	0,92	11641	38,4	660	1455
Az406IM73 H2040V 24A UT	45	73	1700	2040				5843	19,3	332	732
Az406IM73 H2040V 24A LT	45	73	1700	2040				5798	19,1	328	723
Az406IM163 H3560V 31A DBL	100	163	2960	3560	31	0,32	1,05	11641	38,4	660	1455
Az406IM82 H1780V 31A UT	50	82	1480	1780				5843	19,3	332	732
Az406IM82 H1780V 31A LT	50	82	1480	1780				5798	19,1	328	723
Az406IM182 H4000V 30,5A DBL	110	182	3360	4000	30,5	0,36	1,18	13119	43,3	744	1640
Az406IM91 H2000V 30,5A UT	56	91	1680	2000				6537	21,6	374	825
Az406IM91 H2000V 30,5A LT	56	91	1680	2000				6582	21,7	370	816
Az406IM206 H3980V 35A DBL	125	206	3320	3980	35	0,36	1,18	14507	47,9	828	1825
Az406IM103 H1990V 35A UT	63	103	1660	1990				7231	23,9	416	917
Az406IM103 H1990V 35A LT	63	103	1660	1990				7176	23,7	412	908
Az406IM228 H3840V 40A DBL	140	228	3200	3840	40	0,36	1,18	15895	52,5	914	2015
Az406IM114 H1920V 40A UT	70	114	1600	1920				7925	26,2	459	1012
Az406IM114 H1920V 40A LT	70	114	1600	1920				7970	26,3	455	1003

Design data on asynchronous motor 460 series (OD 117 mm) DBL										
Description	Power rating		Voltage, V		Current, A	Min. Fluid velocity		Length		Mass	
	kW @ 50Hz	hp @ 60Hz	@ 50Hz	@ 60Hz		m/s	ft/s	mm	ft	kg	lb
Az460IM206 H4300V 31A DBL	125	206	3600	4300	31	0,42	1,38	10572	34,9	762	1680
Az460IM103 H2200V 31A UT	63	103	1850	2200				5285	17,4	384	847
Az460IM103 H2200V 31A LT	63	103	1850	2200				5287	17,4	378	833
Az460IM228 H3900V 38A DBL	140	228	3240	3900	38	0,46	1,51	12092	39,9	876	1931
Az460IM114 H1950V 38A UT	70	114	1620	1950				6045	19,9	441	972
Az460IM114 H1950V 38A LT	70	114	1620	1950				6047	20,0	435	959
Az460IM262 H4440V 38A DBL	160	262	3700	4440	38	0,52	1,71	13612	44,9	990	2183
Az460IM131 H2220V 38A UT	80	131	1850	2220				6805	22,5	498	1098
Az460IM131 H2220V 38A LT	80	131	1850	2220				6807	22,5	492	1085
Az460IM294 H4500V 42A DBL	180	294	3750	4500	42	0,60	1,97	15132	49,9	1104	2434
Az460IM147 H2250V 42A UT	90	147	1875	2250				7565	25,0	555	1224
Az460IM147 H2250V 42A LT	90	147	1875	2250				7567	25,0	549	1210
Az460IM326 H4560V 44,5A DBL	200	326	3800	4560	44,5	0,66	2,17	16652	55,0	1218	2685
Az460IM163 H2280V 44,5A UT	100	163	1900	2280				8325	27,5	612	1349
Az460IM163 H2280V 44,5A LT	100	163	1900	2280				8327	27,5	606	1336

PERMANENT MAGNET MOTOR / Specification /



Design data on permanent magnet motor 319 series (OD 81 mm) SGL														
Description	Power rating				Voltage, V		Current, A		Min. Fluid velocity		Length		Mass	
	kW		hp											
	@150Hz	@200Hz	@150Hz	@200Hz	@150Hz	@200Hz	@150Hz	@200Hz	m/s	ft/s	mm	ft	kg	lb
Az319PMM19 H550V 19A SGL	11	14	15	19	410	550	18,7	19	0,10	0,33	2129	7,0	70	154
Az319PMM30 H690V 23,4A SGL	17	22	23	30	510	690	23	23,4	0,10	0,33	2717	9,0	90	198
Az319PMM44 H900V 25,3A SGL	24	32	33	44	690	900	24,9	25,3	0,10	0,33	3305	10,9	112	247
Az319PMM54 H1010V 27,8A SGL	30	40	41	54	780	1010	27,4	27,8	0,10	0,33	3893	12,8	135	298
Az319PMM68 H1200V 32,1A SGL	38	50	52	68	840	1200	31,7	32,1	0,15	0,49	4481	14,8	157	346
Az319PMM86 H1300V 34,4A SGL	47	63	64	86	980	1300	34	34,4	0,20	0,66	5069	16,7	179	395
Az319PMM95 H1390V 35,5A SGL	53	70	72	95	1060	1390	35,1	35,5	0,20	0,66	5363	17,7	190	419
Az319PMM109 H1500V 37,9A SGL	60	80	82	109	1130	1500	37,4	37,9	0,25	0,82	5657	18,7	201	443
Az319PMM122 H1670V 37,9A SGL	68	90	92	122	1270	1670	37,4	37,9	0,30	0,98	6245	20,6	224	494

DOWNHOLE MONITORING SYSTEM

DMS

Downhole monitoring system is aimed at measuring and transmitting the actual parameters of the unit to the operation station controller (which maintains submersible AC electric motor)

EXAMPLE

Az DMS P2 V 5800 406 HT SS

Az	DMS	P2	V	5800	406	HT	SS	M1
1	2	3	4	5	6	7	8	9

1	Manufacturer ALMAZ Production Company	
2	DMS - Downhole Monitoring System	
3	Pressure accuracy:	No code - up to 0,1 MPa P1 - up to 0,01 MPa P2 - up to 0,001 MPa
4	Vibration:	No code- without vibration sensor V - with vibration sensor
5	Maximum measured pressure, psi:	5800 - (40 MPa) 8700 - (60 MPa)
6	Series:	319 (housing OD - 81 mm) 406 (housing OD - 103 mm)
7	Heat resistance:	No code- Standard. Ambient temperature - up to 257 °F (125°C) HT - High Temperature. Ambient temperature - up to 302 °F (150°C) UHT - Ultra High Temperature. Ambient temperature - up to 338 °F (170°C)
8	Material:	SS – stainless steel No code – carbon steel
9	Modification of DMS:	No code - standart M1 - Transfer

DOWNHOLE MONITORING SYSTEM / Specification /

	Description	Housing OD		Weight		Installation Length		Parameters		
		in.	mm	lb	kg	ft	mm	Fluid temperature	Temperature of motor oil	mm
	Az DMS P2 V 5800 319	3,19	81	41,73	18,93	2,62	798	+	+	+
	Az DMS P2 V 5800 319 SS			40,79	18,5					
	Az DMS P2 V 5800 319 HT			41,73	18,93					
	Az DMS P2 V 5800-319 HT SS			40,79	18,5					
	Az DMS P2 V 5800 406	4,06	103	0,36	1,18	2,13	648	+	+	+
	Az DMS P2 V 8700 406									
	Az DMS P2 V 5800 406 SS			0,36	1,18					
	Az DMS P2 V 8700 406 SS									
	Az DMS P2 V 5800 406 HT			0,36	1,18					
	Az DMS P2 V 8700 406 HT									
	Az DMS P2 V 5800 406 HT SS			0,36	1,18					
	Az DMS P2 V 8700 406 HT SS									
	Az DMS P2 5800 406 UHT			0,36	1,18			+	+	-
	Az DMS P2 8700 406 UHT									
	Az DMS P2 5800 406 UHT SS			0,36	1,18					
	Az DMS P2 8700 406 UHT SS									

DOWNHOLE CABLE AND MOTOR LEAD EXTENSION

Downhole cable

Downhole cable are used for power supply
of submersible electrical motors,
at alternating voltage with frequency from 30 up to 200 hz

EXAMPLE

Az DC F K FP C 3×AWG6 482 5 G

Az	DC	F	K	FP	C	3×AWG6	482	5	G
1	2	3	4	5	6	7	8	9	10

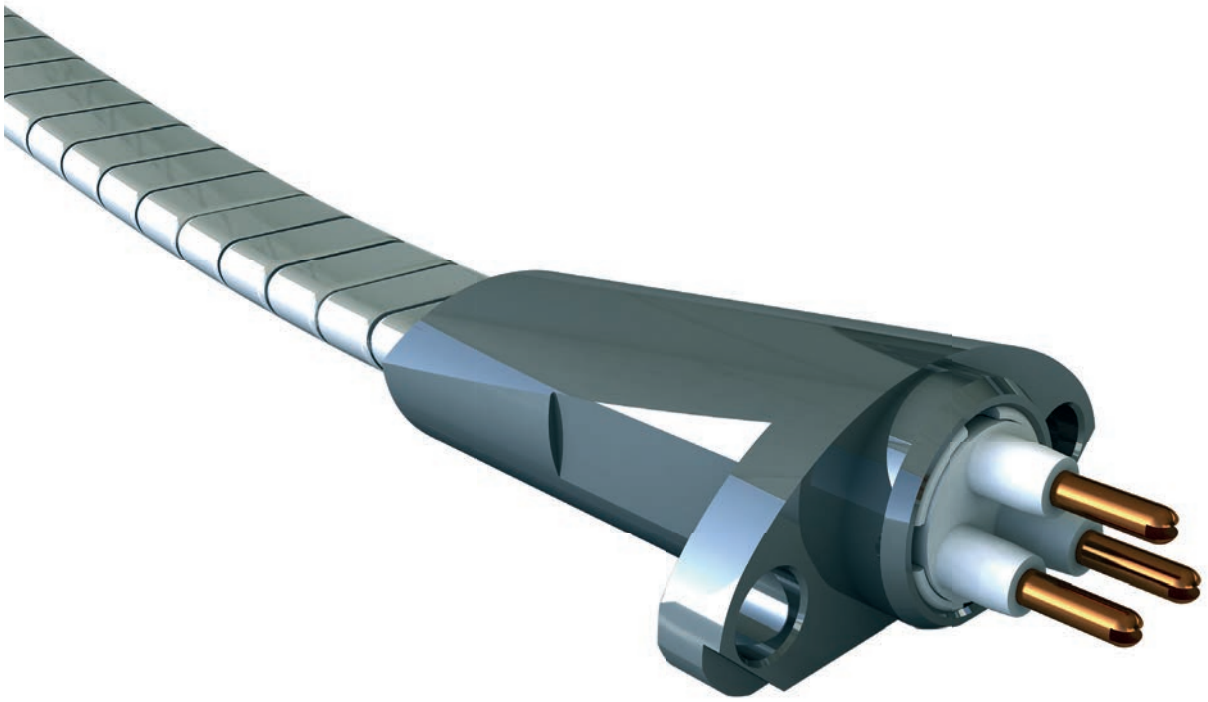
1	Manufacturer ALMAZ Production Company	
2	DC - Downhole cable	
3	Shape:	F - flat R - Round
4	Insulation:	No code - without polyimide film K - polyimide film
5	Jacket:	PP - Polypropylene (double layer of insulation) FP - fluoroplast (double layer of insulation)
6	Braid:	C - Cotton tape P - Polyamide tape
7	Cable size (count of conductors × size): 3×7 (mm²); 3×8 (mm²); 3×10 (mm²); 3×AWG6 [13,3 mm²]; 3×16 (mm²);3×AWG4 [21,15 mm²]; 3×25 (mm²)	
8	Temperature raiting, F	
9	Rated voltage, kV : 3.3; 4; 5	
10	Armor:	G - Galvanized armor SS - Stainless steel M - MONEL

DOWNHOLE CABLE / Specification /

	Description	Cable size	Temperature raiting		Weight of 1000 m	
			F	°C	lb	kg
	Az DC F-K-FP-X-X-446-5-X Az DC F-K-FP-X-X-482-5-X	7	446 482	230 250	1640	744
		8			1728	784
		10			1898	861
		3×AWG6			2211	1003
		16			2442	1108
		3×AWG4			2844	1290
		25			3159	1433
	Az DC F-PP-X-X-248-3.3-X Az DC F-PP-X-X-248-4-X Az DC F-PP-X-X-266-3.3-X Az DC F-PP-X-X-266-4-X	10	248 266	120 130	2022	917
		3×AWG6			2271	1030
		16			2491	1130
		3×AWG4			2844	1290
		25			3115	1413

DOWNHOLE CABLE AND MOTOR LEAD EXTENSION

Motor Lead Extension



EXAMPLE

Az DMS P2 V 5800 406 HT SS

Az	DMS	P2	V	5800	406	HT	SS
1	2	3	4	5	6	7	8

1	Manufacturer ALMAZ Production Company	
2	MLE - Motor Lead Extension	
3	Type of seal:	RC - Radial and Conic C - Conic
4	Shape of cable:	F - flat R - Round
5	Insulation:	No code - without polyimide film K - with polyimide film
6	Jacket:	PP - Polypropylene (double layer of insulation) FP - fluoroplast (double layer of insulation)
7	Braid:	C - Cotton tape P - Polyamide tape
8	Cable size (count of conductors × size): 3×7 (mm²); 3×8 (mm²); 3×10 (mm²); 3×AWG6 [13,3 mm²]; 3×16 (mm²); 3×AWG4 [21,15 mm²]; 3×25 (mm²)	
9	Temperature raiting, F	
10	Rated voltage, kV : 3.3; 4; 5	
11	Armor :	G - Galvanized armor SS - Stainless steel M - MONEL
12	Length, ft	

INDUCTION MOTOR / Specification /

Type	Length		Weight, lb						
			Cable size						
	ft	mm	3×7	3×8	3×10	3×AWG6	3×16	3×AWG4	3×25
Az MLE C F-K-FP-X-3×7-446-5-X-X	66	20	33,9	35,7	39,7	46	50,6	58,6	65
Az MLE C F-K-FP-X-3×8-446-5-X-X Az MLE C F-K-FP-X-3×10-446-5-X-X	82	25	42,1	34,1	49,2	57,1	62,8	72,9	80,8
Az MLE RC F-K-FP-X-3×10-446-5-X-X Az MLE RC F-K-FP-X-3×AWG6-446-5-X-X	98	30	50,3	40,5	58,7	68,1	75,1	87,1	96,5
Az MLE RC F-K-FP-X-3×16-446-5-X-X Az MLE RC F-K-FP-X-3×AWG4-446-5-X-X	115	35	58,5	47	68,2	79,2	87,3	101,3	112,4
Az MLE RC F-K-FP-X-3×25-446-5-X-X Az MLE C F-K-FP-X-3×7-482-5-X-X	131	40	66,7	53,4	77,7	90,2	99,5	115,5	128,1
Az MLE C F-K-FP-X-3×8-482-5-X-X Az MLE C F-K-FP-X-3×10-482-5-X-X	148	45	74,9	59,8	87,2	101,3	111,7	129,7	143,9
Az MLE RC F-K-FP-X-3×10-482-5-X-X Az MLE RC F-K-FP-X-3×AWG6-482-5-X-X	164	50	83,1	66,3	96,7	112,3	123,9	144	159,7
Az MLE RC F-K-FP-X-3×16-482-5-X-X Az MLE RC F-K-FP-X-3×AWG4-482-5-X-X	180	55	91,3	72,7	106,2	123,4	136,1	158,2	175,5
Az MLE RC F-K-FP-X-3×25-482-5-X-X	197	60	45,1	79,1	115,7	134,4	148,3	172,4	191,3
Az MLE RC F-PP-X-3×10-248-3.3-X-X Az MLE RC F-PP-X-3×10-248-4-X-X	49	15	–	–	26,7	30	34,2	43,4	47
Az MLE RC F-PP-X-3×AWG6-248-3.3-X-X Az MLE RC F-PP-X-3×AWG6-248-4-X-X	66	20	–	–	34,8	39,2	44,8	57,3	62,2
Az MLE RC F-PP-X-3×16-248-3.3-X-X Az MLE RC F-PP-X-3×16-248-4-X-X	82	25	–	–	43,2	48,7	55,6	71,2	77,2
Az MLE RC F-PP-X-3×AWG4-248-3.3-X-X Az MLE RC F-PP-X-3×AWG4-248-4-X-X	98	30	–	–	51,4	58	66,4	85,1	92,2
Az MLE RC F-PP-X-3×25-248-3.3-X-X Az MLE RC F-PP-X-3×25-248-4-X-X	115	35	–	–	59,8	67,5	77,2	99	107,4
Az MLE RC F-PP-X-3×10-266-3.3-X-X Az MLE RC F-PP-X-3×10-266-4-X-X	131	40	–	–	67,9	79,7	88	112,9	122,4
Az MLE RC F-PP-X-3×AWG6-266-3.3-X-X Az MLE RC F-PP-X-3×AWG6-266-4-X-X	148	45	–	–	76,3	86,2	98,8	126,8	137,6
Az MLE RC F-PP-X-3×16-266-3.3-X-X Az MLE RC F-PP-X-3×16-266-4-X-X	164	50	–	–	84,4	95,5	109,4	104,7	152,6
Az MLE RC F-PP-X-3×AWG4-266-3.3-X-X Az MLE RC F-PP-X-3×AWG4-266-4-X-X	180	55	–	–	92,8	104,9	102,2	154,5	167,6
Az MLE RC F-PP-X-3×25-266-3.3-X-X Az MLE RC F-PP-X-3×25-266-4-X-X	197	60	–	–	101	114,2	131	168,4	182,7