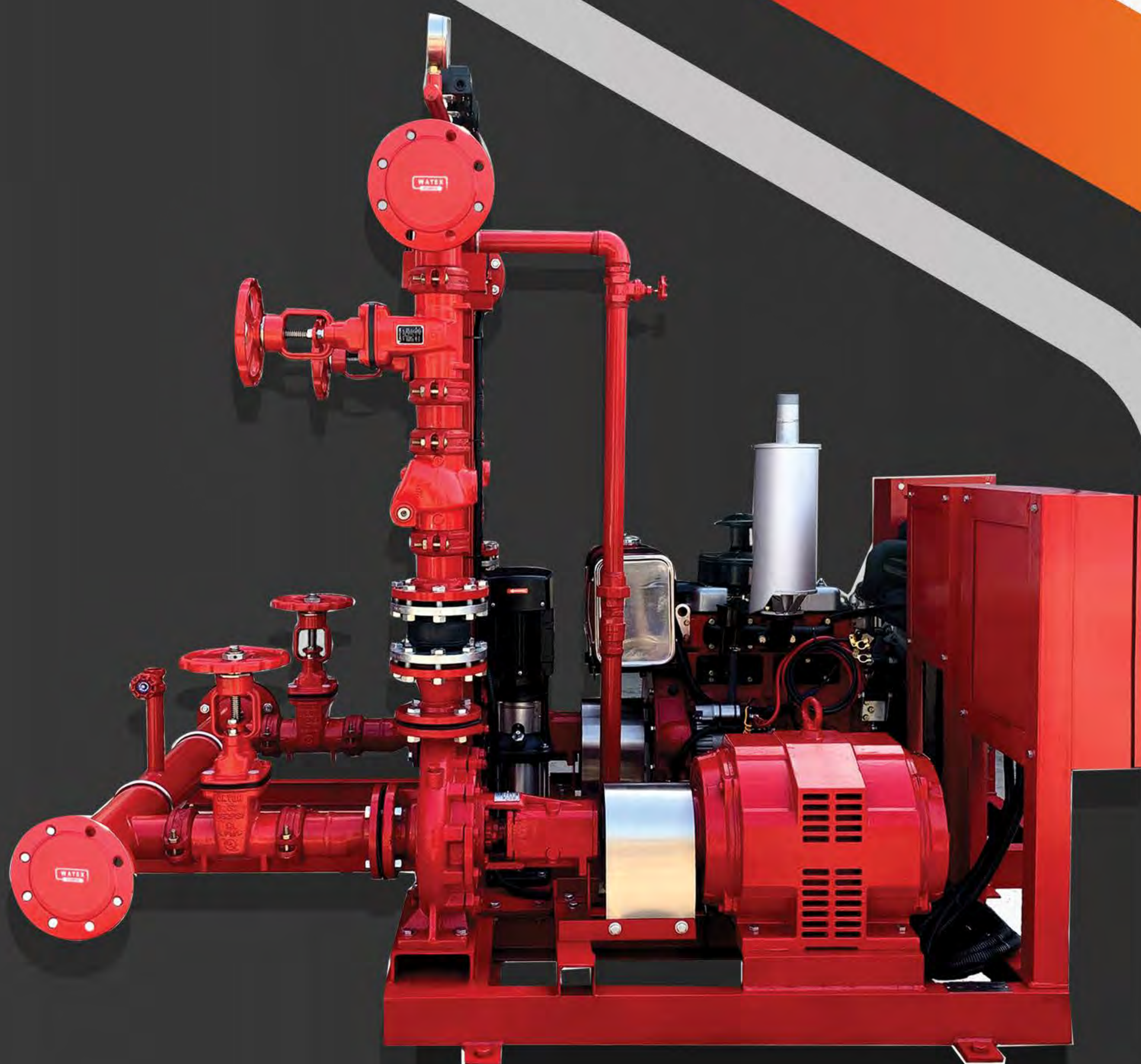




DEGREE[®]

www.fire-degree.com

FIRE PUMP SYSTEM



■ MAIN ELECTRIC PUMP - NFPA PERFORMANCE

BRAND	Fire degree
MODEL	WS 100-310
CAPACITY	1000GPM
HEAD	11 BAR
PUMP CASING	CAST IRON
IMPELLER	CAST IRON
SHAFT	STAINLESS STEEL
SHAFT SEAL	MECH. SEAL
MOTOR/MODEL	MARATHON/ 405TSTD4009
VOLTAGE	380V,50HZ, 3PH
POWER	125 HP
SPEED	2970/2945 RPM
INSULATION	CLASS F
PROTECTION	IP 23

■ STANDBY DIESEL PUMP- NFPA PERFORMANCE

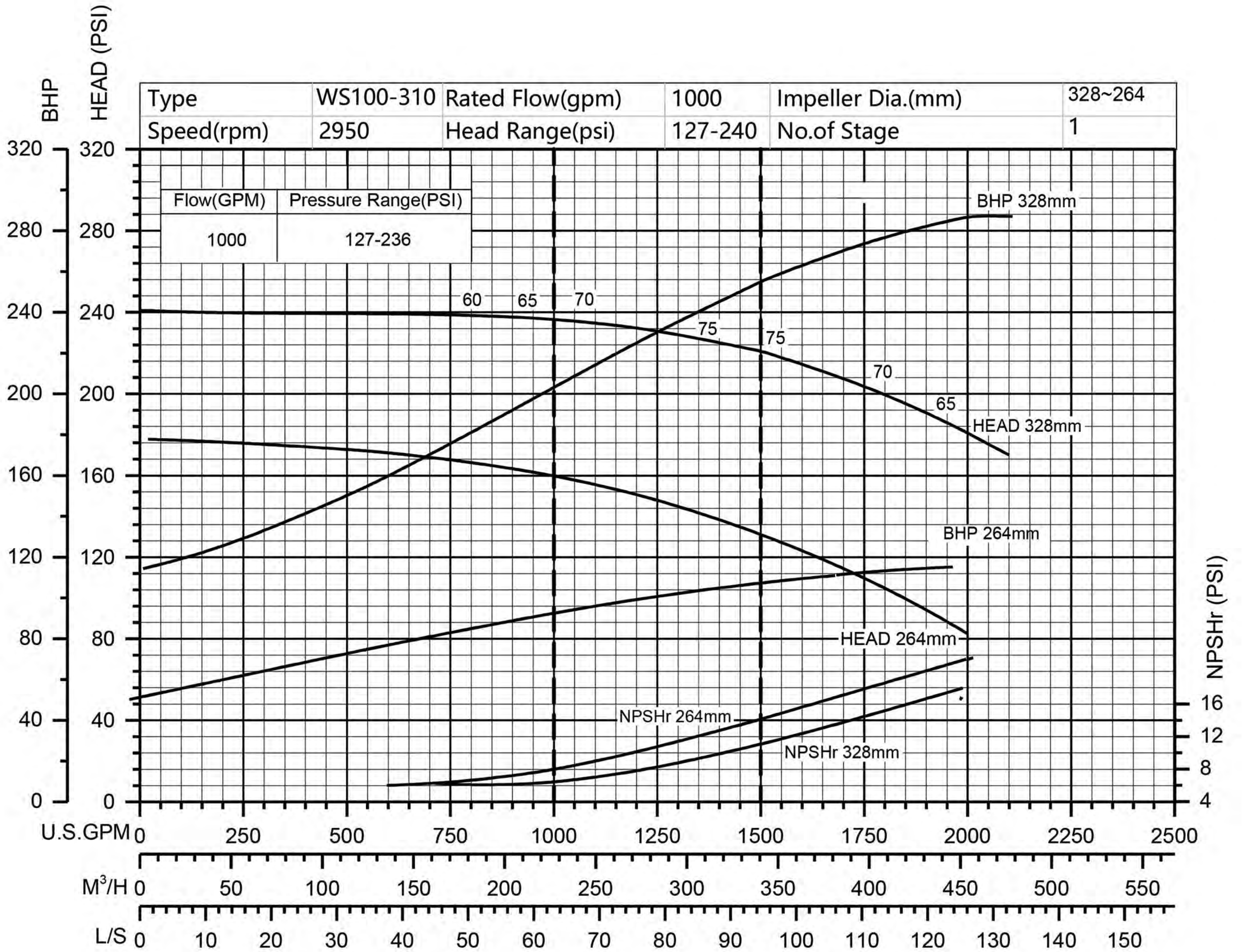
BRAND	Fire degree
MODEL	WS 100-310
CAPACITY	1000 GPM
HEAD	11 BAR
PUMP CASING	CAST IRON
IMPELLER	CAST IRON
SHAFT	STAINLESS STEEL
SHAFT SEAL	MECH. SEAL
ENGINE/MODEL	POWER / 4108BZL
VOLTAGE	12VDC
POWER /SPEED / DIESEL TANK	120 HP / BUILT IN
SPEED	3000 RPM

■ JOCKEY PUMP

MODEL	RV10-14 35GPM/12BAR - 5.5KW - 50HZ
IMPELLER / SHAFT	STAINLESS STEEL
PRESSURE SWITCH	PACIFIC
VALVES	ONTOR/WINGROU/GALA 6" UL/FM
CONTROLLERS	LS Brand - Made in Korea

* NOTE: MATERIAL SELECTION SUBJECTS TO FACTORY'S CHOICE

Performance Curve



Split Case Fire Pumps



Series of WS (SPLIT CASE) fire pumps are serialization products as Horizontal Single Stage, Single Flow Volute Casing Centrifugal pumps with axial Inlet which designed according to NFPA 20 for firefighting Applications.

Models

- WS 80 - 270 • WS 100 - 310 • WS 100 - 360 • WS 125 - 290
- WS 125 - 360 • WS 150 - 460

Split Case Type

Rated Flow - Q up to 2500 GPM
 Pressure - P up to 420psi
 Temperature - T up to 105 C
 Shaft Sealing Soft Packing

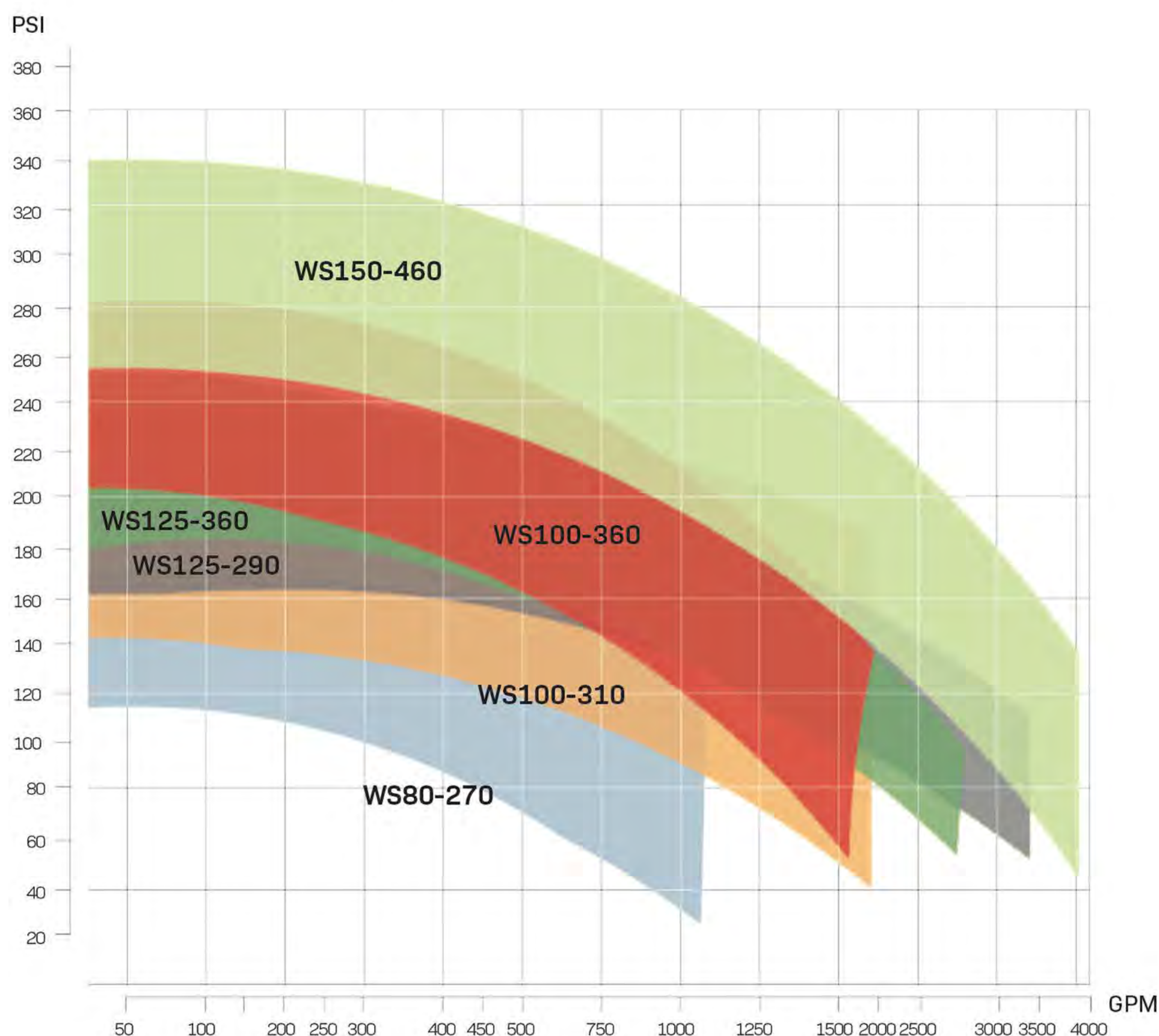


Features

- Designing applies to NFPA20 Standards and specification in accordance with UL448 and FM approval
- Max shaft power point is attained by hydraulic performance instead of pump cavitation, which truly qualified for NFPA20 requirements, as well as ensure safety and reliability of pump units
- Adaptable of electric motor and combustion engine as prime mover
- Varied revolong speed or performance pumps can be supplied according to user's requests
- Max shaft power point is closed to the point of 150% rated capacity therefore the power and cost are low
- Pressure at shut off point small which require lower pressure rating of fittings or accessories, save cost for whole unit
- Single model covers wide performance range, no need to purchase different models with benefits clients by reducing inventory and shorten delivery

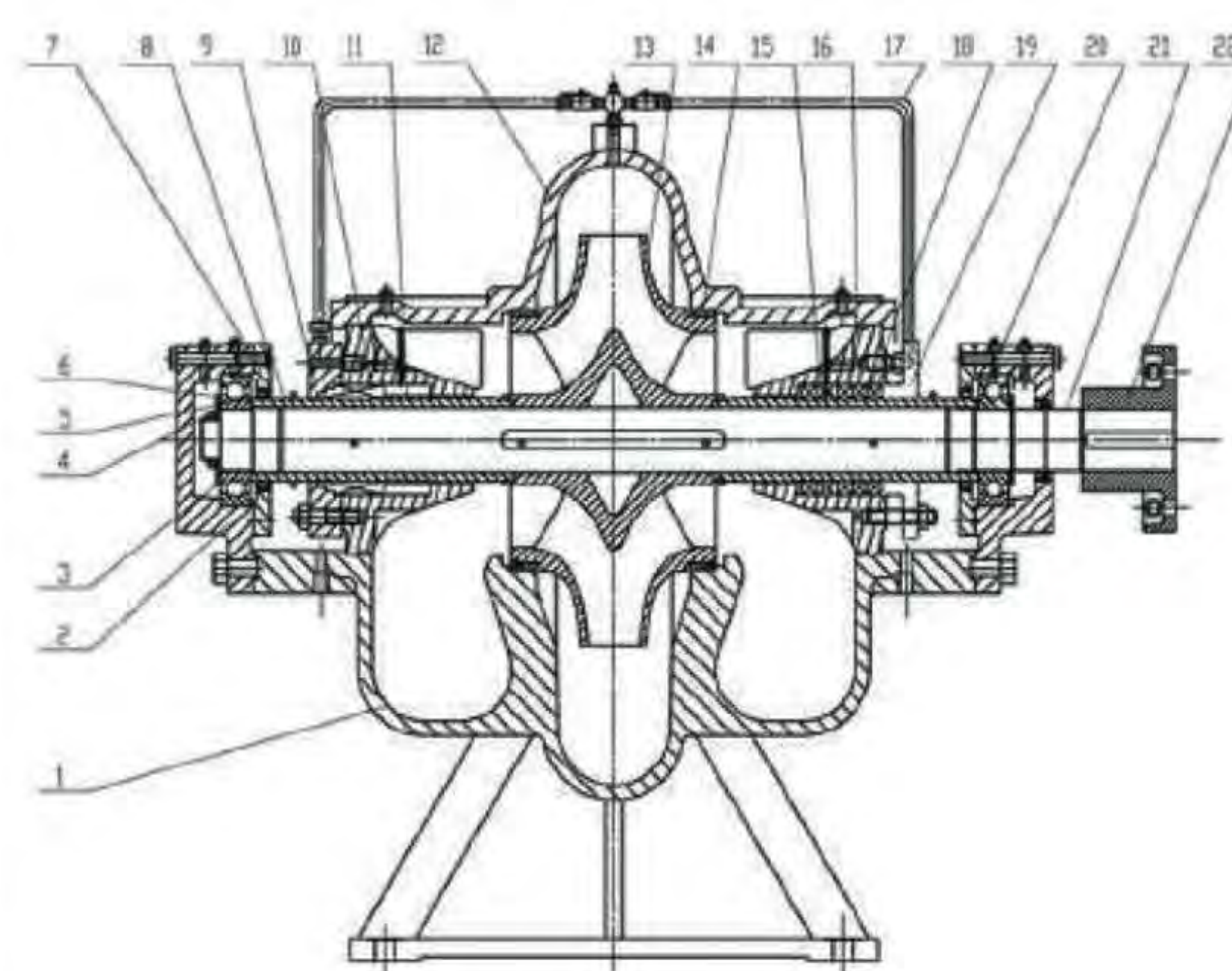
PRODUCT RANGE

Split Case Fire Pumps Spectrum Chart



PRODUCT SPECIFICATIONS

No	Part Name	Material	No	Part Name	Material
1	Casing	Ductile Cast Iron	12	Casing Cover	Ductile Cast Iron
2	Bearing Housing	Cast Iron	13	Impeller	Stainless Steel/ Bronze
3	Deep Groove Ball Bearing	Bearing Steel	14	Impeller Ring	Stainless Steel/ Bronze
4	Lock Nut	Carbon Steel	15	Packing Ring	Stainless Steel
5	Lip Seal	Rubber	16	Seal Housing	Cast Iron
6	Bearing Ring	Carbon Steel	17	Flushing Pipe	Stainless Steel/ Bronze
7	Bearing Gland	Cast Iron	18	Gland Packing	Oil Immersed Asbestos
8	Shaft Sleeve	Stainless Steel/ Bronze	19	Packing Gland	Cast Iron
9	Mechanical Seal Gland	Cast Iron	20	Bearing Liner	Carbon Steel
10	Mechanical Seal	Corrosion Resistant material	21	Shaft	Stainless Steel
11	Seal Bushing	Stainless Steel/ Bronze	22	Coupling	Cast Iron



ELECTRIC MOTORS

DATA SHEET



FIRE PUMP MOTORS





MARATHON®

The impellers are closed impellers with extra smooth surface finish and In 1913, the founders of a new motor company that they named Marathon Electric had a simple vision:

- Serve our customers according to their needs.
- Produce the most efficient and long-lasting motors.
- Commit to new technology and research.
- Expand and diversify into new markets.

The company was located in the heartland of America, Wausau, Wisconsin, where it remains today, over one hundred years later. The company continues to be one of the innovators in the motor industry, built on a history of industry first! Marathon engineered, designed, and built the first fire pump motor and we continue to lead the life safety industry with Marine Duty UL fire pump motors, medium voltage, vertical hollow shaft UL fire pump motors, and specialty UL Fire Pump motors.

When a fireman needs a trusted friend in an emergency, he knows Marathon will do the job, offering protection, high performance, and reliability as we have for over one hundred years ... that's a legacy!

PRODUCT LINE

ODP

- Available in NEMA or IEC construction these motors are ideal for in-door applications. Lower cost and longer product life due to lower temperature windings make these a best value option.
- These motors are available from 25-500HP, 2 and 4 poles, Epact Efficiency. All motors are 12 leads for wye-delta or across-the-line start, part winding start is available in single voltage or at lower voltage for dual voltage motors. All motors have 1.15 service factor for all voltages. years ... that's a legacy!

TEFC

- Available in NEMA or IEC construction, TEFC motors are ideal for applications in tough environments.
- These motors are available from 25-500HP, 2 and 4 poles, Epact Efficiency. All motors are 12 leads for wye-delta or across the line start, part winding start is available in single voltage or at lower voltage for duo voltage motors. All motors have 1.15 service factor for all voltages.

CLOSE COUPLED PUMP

- Available as JP or JM constructions, these motors are ideal when space is an issue. This integrated design enables a lower system cost.
- 2 and 4 poles, Epact Efficiency. Horizontal or vertical ODP construction.
- All motors have 1.15 service factor for all voltages.

VSS AND VHS

- Vertical solid shaft and hollow shaft constructions are ideal for deep well applications with turbine pumps. These motors are designed to handle the highest thrust loads of this system.
- VSS motors are available from 3-400 HP, 2 to 8 poles and are designed for normal and medium thrust, Epact Efficiency.
- All motors are 12 leads for wye-delta or across the line start, part winding start is available in single voltage or at lower voltage for duo voltage motors. All motors have 1.15 service factor for all voltages.
- VHS motors are available from 7.5HP to 300HP, 2 and 4 poles, WP1, Epact Efficiency.
- All motors are 12 leads for wye-delta or across-the-line start, part winding start is available in single voltage or at lower voltage for dual voltage motors. All motors have 1.15 service factor for all voltages.

MEDIUM VOLTAGE

- Regal also offers Medium Voltage products in NEMA and IEC constructions designed specifically for Fire Pump Applications.
- NEMA Construction, from 200 to 700HP, 2300V & 4000V 50/60HZ, 2 and 4 poles, IP22, 1.15 service factor. IEC Construction, from 185kW to 2800kW, 3kV through 10kV 50HZ & 4kV through 13.8kV 60HZ, 4 poles, IP23.



UL LISTED MOTORS

NAMEPLATES

Fire pump motors have two nameplates, the normal nameplate with UL label and special fire pump nameplate with the UL listing for fire pumps.



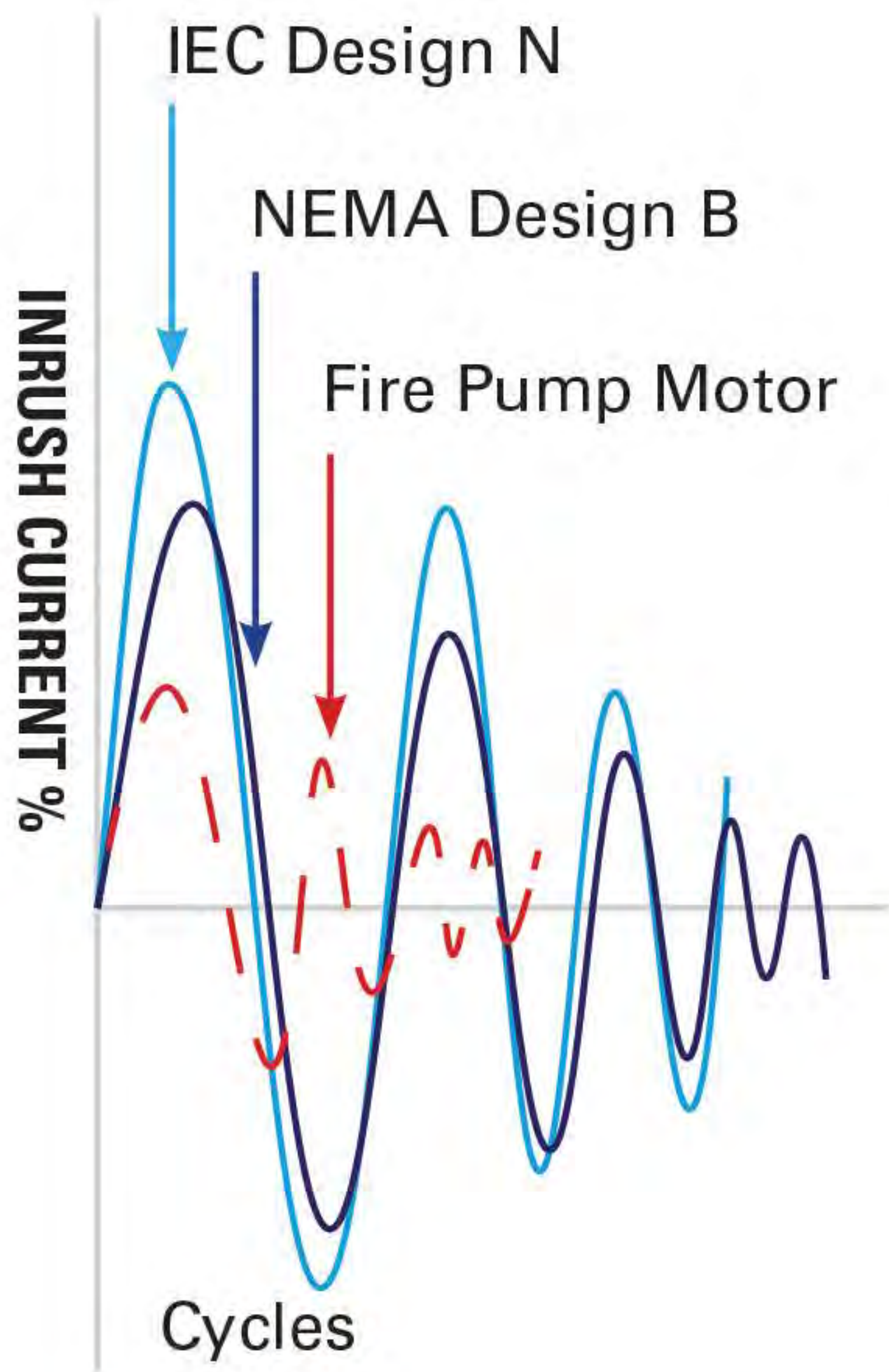


62EL
EX5190
LISTED Fire Pump Motor

marathon[™]

Motors

FIRE PUMP MOTOR INRUSH CURRENTS

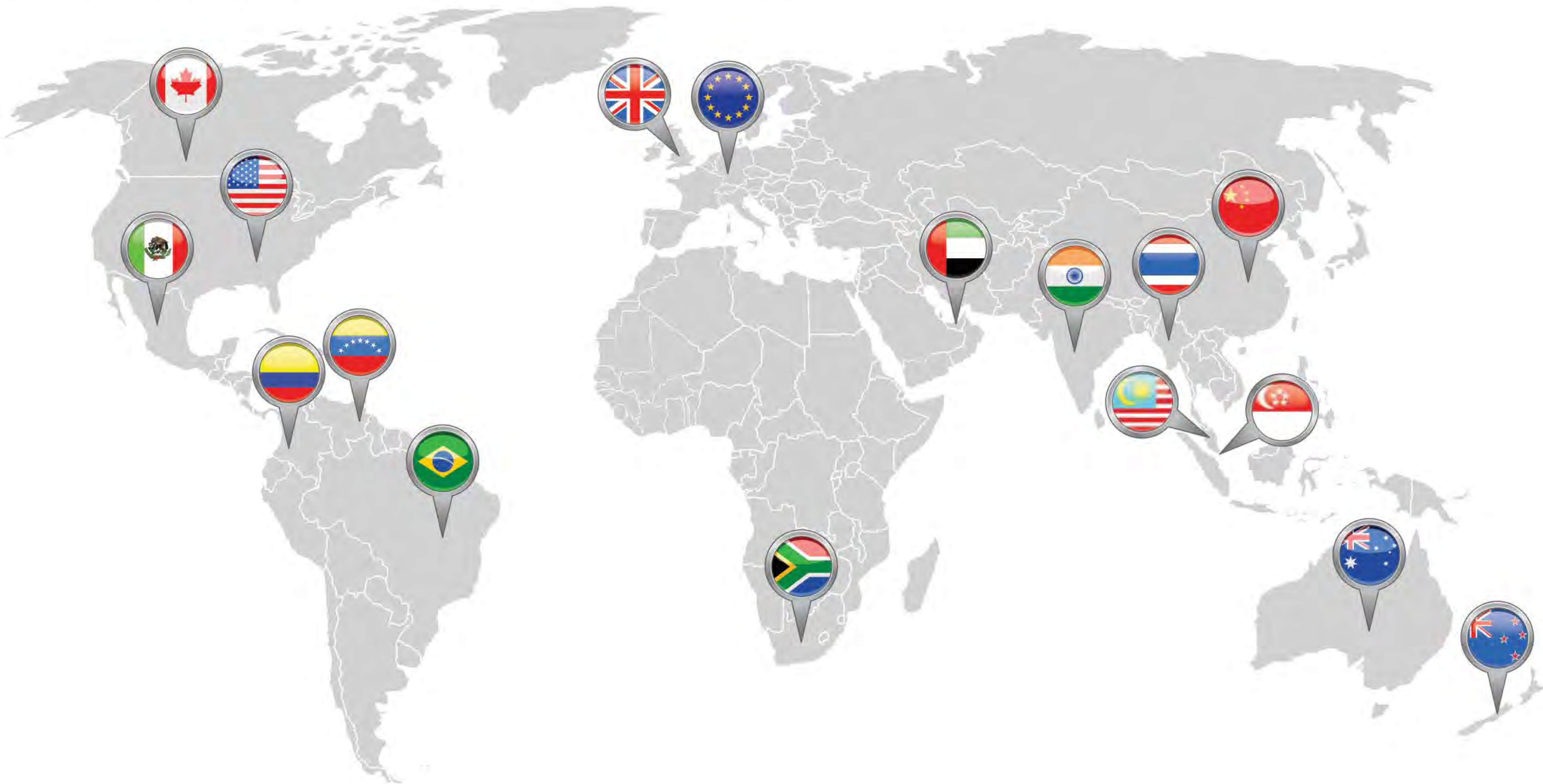


Classification	Locked-Rotor Torque (% Rated-Load Torque)	Breakdown Torque (% Rated-Load Torque)	Locked-Rotor Current (% Rated-Load Current)
UL Fire Pump Motor	70-275*	175-300*	300-600
Design B – Normal locked-rotor torque and normal locked-rotor current	70-275*	175-300*	600-700
IEC 34-12 Design N locked-rotor torques and currents	75-190*	160-200*	800-1000

*Higher values are for motors having lower horsepower ratings.

REGAL WORLD FOOTPRINT

The motor you want, where you are, when you need.



CODES & CERTIFICATIONS

FIRE PUMP SYSTEM

A fire pump system is part of a fire sprinkler system's water supply either connected to the public underground water supply piping, or a static water source.

A fire pump system is tested and listed for its use specifically for fire service by a third-party accredited testing and listing laboratory, such as FM, LPCB, UL, VdS. Additionally, installation of fire pump systems is coordinated by Comité Européen Des Assurances in Europe and the National Fire Protection Code in the U.S.

FIRE PUMP MOTORS

A fire pump motor is a definite purpose motor designed to meet UL Standard of Safety 1004-1 Rotating Electrical Machines - General Requirements - and UL 1004-5 Fire Pump Motors. These motors are designed and built with a low KVA code to reduce inrush currents, offer extended life, and are tested to meet the highest standards in the industry.

Fire pump motors consist of low voltage NEMA Open Dripproof motors, NEMA JM/JMV/JP/JPV Close-Coupled pump motors, NEMA vertical solid shaft P-base motors, NEMA vertical hollow shaft motors, NEMA Totally Enclosed motors. We manufacture a line of low voltage IEC Totally Enclosed motors and Marine Duty IEC Totally Enclosed motors. These motors carry the UL mark and file number for fire pump motors. Additionally, we manufacture a line of low voltage IEC non-UL motors in IE1, IE2, and IE3 efficiencies for Europe, certain areas of the Middle East, Asia, Africa, and portions of Latin America.

UL also defines requirements for fire pump motors above 500 HP and greater than 600 volts, Marathon markets a line of high efficiency 2300V, 4160V and 7.2kV NEMA and IEC open motors for fire pump applications. These motors meet the same high standards as Marathon's low voltage UL listed motors.

COMITÉ EUROPÉEN DES ASSURANCES (CEA)

Insurance Europe (known as Comité Européen des Assurances until March 2012) is the European insurance and reinsurance federation. Through its 34 member bodies - the national insurance associations - it represents all types of insurance and reinsurance undertakings. Standard CEA 4046 – CEA Rules for the approval of Installers of Fire Fighting Systems in accordance with CEA 4046 covers the installation of fire pump systems.

FACTORY MUTUAL (FM)

Factory Mutual specializes in loss prevention services throughout the world in the Highly Protected Risk (HPR) property insurance market sector. The company employs a business model whereby risk and premiums are determined by engineering analysis as opposed to historically based actuarial calculations. FM engineering personnel regularly visit insured locations to evaluate hazards and recommend improvements.

FM Approved fire pump packages are produced using components that have been subjected to rigorous tests to ensure that they will perform when called upon throughout the duration of a fire event. A FM Approved fire pump system will test the driver (motor, diesel or steam), pump and controller as a system to assure the performance characteristics of the system meet the protection requirements for the property.

LOSS PREVENTION CERTIFICATION BOARD (LPCB)

The LPCB has been working with industry and government for more than 100 years to set the standards necessary to ensure that fire and security products and services work effectively.

In that time the LPCB Mark has become an internationally recognized mark of trust. Under the LPCB label, third-party certification and listing of fire and security products and services are available, so that: architects and specifiers can be sure that those they select will perform as required, and manufacturers and suppliers can demonstrate the quality of their products and services.

NATIONAL FIRE PROTECTION CODE 20 (NFPA 20)

NFPA 20 – The Standard for Installation of Stationary Pumps for Fire Protection codifies the requirements for safe electrical installations of a fire pump system into a single, standardized source. The NFPA 20 code covers water supply requirements, pump requirements, pump sizing, pump types, pump drivers, and accessory equipment such as valves and flow meters used in a fire pump system. It is part of the National Fire Codes series published by the National Fire Protection Association (NFPA), and while not itself a U.S. law, NEC use is commonly mandated by state or local law.

UNDERWRITERS LABORATORY

Underwriters Laboratories (UL) is a global independent safety science company with more than a century of expertise innovating safety solutions. UL helps safeguard people, products and places by certify, validating, testing, inspecting, auditing, advising, and educating. The UL Mark is the single most accepted certification for fire pump systems and motors in the world.

VDS 2095 – VdS

is an independent institution which has been ensuring safety and trust in the fields of fire protection and security for many decades. The activities of VdS in the field of fire protection are targeted at the effectiveness and reliability of installed fire protection systems. The basis of the VdS approval process are the coordinated European specifications for installers of fire protection and security systems (CEA 4048 and CEA 4049) of the Comité Européen des Assurances (CEA). Furthermore, the approval process takes full account of the requirements of DIN 14675 with regard to the proof of competence of the installers (described in DIN 14675 as specialist companies). VdS is accredited for the certification of BMA installers by Deutsche Akkreditierungs GmbH (DAkkS) according to DIN EN 45011.

ODP 50 HZ

MODEL	FRAME	POLES	HP	EFF(%)	P F	V	Hz	FLA (A)	LRA (A)	Rpm	Tst/Tn	Tm/Tn
256TTDBD4024	256T	2	20	89.5	0.87	190/380	50	58/29	431/215	2945	1.3	2
256TTDBD4024	256T	2	25	91	0.87	208/415	50	66/33	492/246	2940	1.3	2
256TTDBD4024	256T	2	20	90.2	0.87	200/400	50	54/27	409/204	2950	1.3	2
284TSTDBD4002	284TS	2	25	90.2	0.86	190/380	50	72/36	539/269	2955	1.3	2
284TSTDBD4002	284TS	2	30	90.2	0.85	208/415	50	81/40.6	591/296	2955	1.3	2
284TSTDBD4002	284TS	2	25	90.2	0.85	200/400	50	70/35	512/256	2960	1.3	2
286TSTDBD4022	286TS	2	30	91	0.87	190/380	50	87/43.5	647/323	2958	1.3	2
286TSTDBD4022	286TS	2	40	90.2	0.86	208/415	50	106/53	788/395	2950	1.25	2
286TSTDBD4022	286TS	2	30	91	0.85	200/400	50	84/42	614/307	2962	1.3	2
324TSTD4010	324TS	2	40	91.7	0.88	190/380	50	110/55	863/431	2965	1.25	2
324TSTD4009	324TS	2	50	92.4	0.88	208/415	50	128/64	985/493	2962	1.2	2
324TSTD4010	324TS	2	40	91.7	0.87	200/400	50	108/54	819/409	2970	1.25	2
326TSTD4024	326TS	2	50	92.4	0.88	190/380	50	139/70	1078/539	2962	1.2	2
326TSTD4024	326TS	2	60	91.7	0.88	208/415	50	152/76	1182/592	2962	1.2	2
326TSTD4024	326TS	2	50	92.4	0.87	200/400	50	132/66	1024/512	2965	1.2	2
364TSTD4025	364TS	2	60	92.4	0.88	190/380	50	166/83	1294/647	2970	1.2	2
364TSTD4009	364TS	2	75	93	0.88	208/415	50	190/95	1478/740	2965	1.05	2
364TSTD4025	364TS	2	60	93	0.87	200/400	50	160/80	1229/614	2972	1.2	2
365TSTD4025	365TS	2	75	93	0.88	190/380	50	210/105	1618/809	2970	1.05	2
365TSTD4010	365TS	2	100	93	0.88	208/415	50	256/128	1970/987	2965	1.05	2
365TSTD4025	365TS	2	75	93	0.87	200/400	50	200/100	1537/768	2972	1.05	2
404TSTD4017	404TS	2	100	93	0.88	380	50	135	1078	2975	1.05	2
404TSTD4009	404TS	2	125	93	0.88	415	50	155	1234	2970	1	2
404TSTD4017	404TS	2	100	93	0.87	400	50	130	1024	2978	1.05	2
405TSTD4009	405TS	2	125	93	0.89	380	50	168	1348	2970	1	2
405TSTD4009	405TS	2	150	93.6	0.89	415	50	185	1481	2970	1	2
405TSTD4006	405TS	2	125	93	0.88	400	50	160	1281	2975	1	2
444TSTD4010	444TS	2	150	94.1	0.88	380	50	200	1618	2978	1	2
444TSTD4009	444TS	2	200	94.5	0.89	415	50	245	1975	2975	1	2
444TSTD4010	444TS	2	150	94.5	0.87	400	50	190	1537	2980	1	2
445TSTD4007	445TS	2	200	94.1	0.88	380	50	265	2157	2975	1	2
445TSTD4009	445TS	2	250	94.5	0.89	415	50	305	2469	2975	0.7	1.75
445TSTD4007	445TS	2	200	94.2	0.87	400	50	252	2049	2978	1	2
	447TS	2	300	95	0.91	380	50	393	3236	2975	0.7	1.75
	447TS	2	300	95	0.91	415	50	360	2963	2975	0.7	1.75
	447TS	2	300	95	0.91	400	50	374	3074	2975	0.7	1.75
	449TS	2	350	95	0.91	380	50	459	3775	2975	0.7	1.75
	449TS	2	350	95	0.91	415	50	420	3457	2975	0.7	1.75
	449TS	2	350	95	0.91	400	50	436	3586	2975	0.7	1.75
	449TS	2	400	95.4	0.91	380	50	522	4315	2975	0.7	1.75

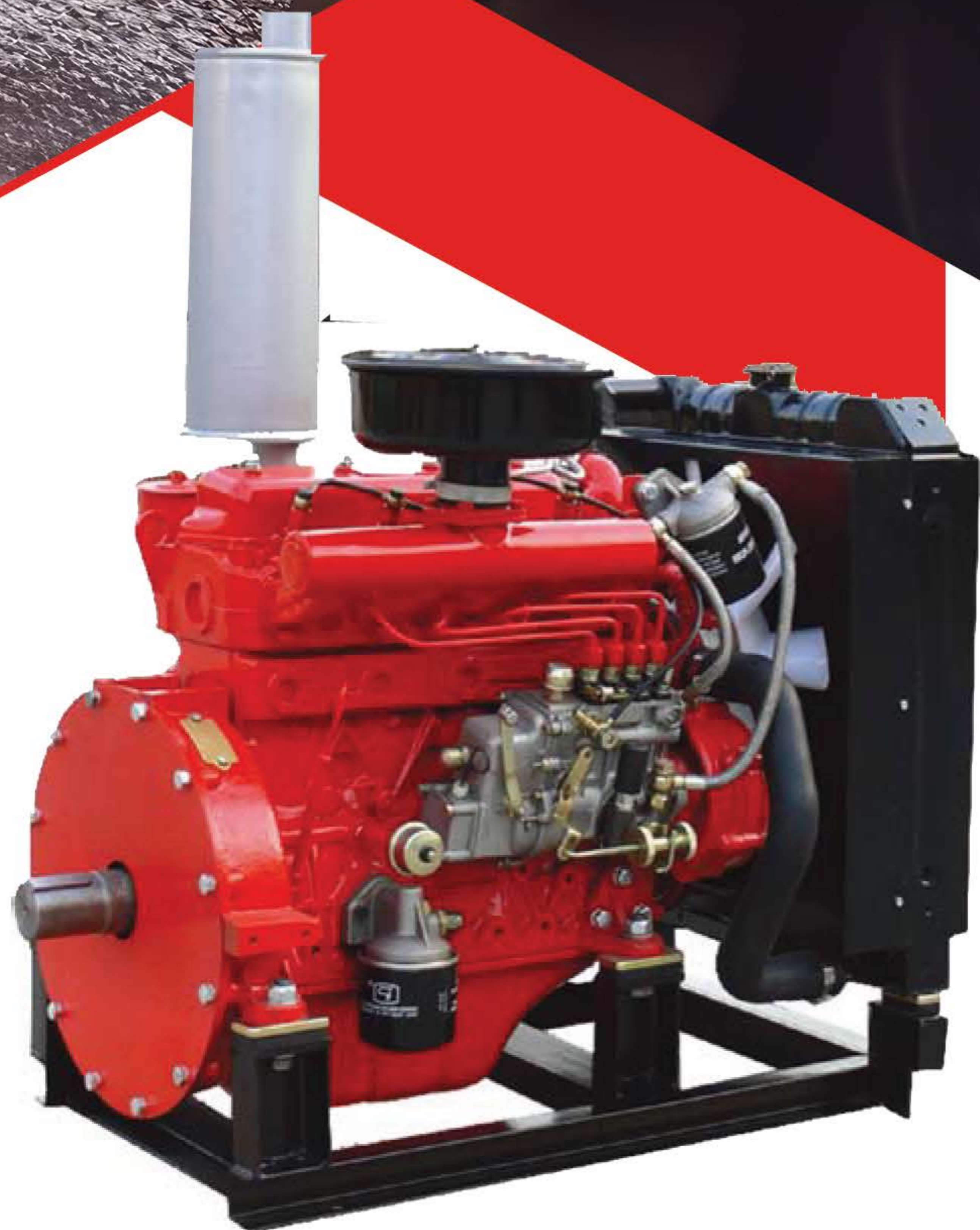
	449TS	2	400	95.4	0.91	415	50	478	3951	2975	0.7	1.75
	449TS	2	400	95.4	0.91	400	50	496	4099	2975	0.7	1.75
284TTDBD4027	284T	4	20	90.2	0.83	190/380	50	60/30	431/215	1472	1.5	2
284TTDBD4027	284T	4	25	90.2	0.83	208/415	50	70/35	492/246	1470	1.5	2
284TTDBD4027	284T	4	20	91	0.82	200/400	50	58/29	409/204	1475	1.5	2
286TTDBD4041	286T	4	25	91	0.85	190/380	50	73/37	539/269	1468	1.5	2
286TTDBD4041	286T	4	30	91	0.84	208/415	50	82/41	591/296	1468	1.4	2
286TTDBD4041	286T	4	25	91.7	0.84	200/400	50	70/35	512/256	1472	1.5	2
324TTDCD4038	324T	4	30	92.4	0.85	190/380	50	86/43	647/323	1478	1.5	2
324TTDCD4038	324T	4	40	91.7	0.84	208/415	50	108/54	788/395	1475	1.4	2
324TTDCD4038	324T	4	30	92.4	0.83	200/400	50	84/42	614/307	1480	1.5	2
326TTDCD4345	326T	4	40	92.4	0.85	190/380	50	115/57.5	863/431	1475	1.4	2
326TTDCD4345	326T	4	50	91.7	0.84	208/415	50	136/68	985/493	1472	1.4	2
326TTDCD4345	326T	4	40	92.4	0.84	200/400	50	111/55.5	819/409	1478	1.4	2
364TSTDCD4332	364TS	4	50	93	0.87	190/380	50	140/70	1078/539	1478	1.4	2
364TSTDCD4332	364TS	4	60	92.4	0.86	208/415	50	155/77.5	1182/592	1478	1.4	2
364TSTDCD4332	364TS	4	50	93	0.86	200/400	50	134/67	1024/512	1480	1.4	2
365TSTDCD4332	365TS	4	60	93.6	0.87	190/380	50	165/82.5	1294/647	1480	1.4	2
365TSTDCD4332	365TS	4	75	93.6	0.87	208/415	50	190/95	1478/740	1478	1.4	2
365TSTDCD4332	365TS	4	60	93.6	0.86	200/400	50	157/78.5	1229/614	1482	1.4	2
404TSTDCD4332	404TS	4	75	93.6	0.87	190/380	50	210/105	1618/809	1485	1.4	2
404TSTDCD4332	404TS	4	100	93.6	0.87	208/415	50	256/128	1970/987	1485	1.25	2
404TSTDCD4332	404TS	4	75	93.6	0.86	200/400	50	200/100	1537/768	1488	1.4	2
405TSTDCD4332	405TS	4	100	94.1	0.87	380	50	138	1078	1485	1.25	2
405TSTDCD4332	405TS	4	125	93.6	0.87	415	50	158	1234	1482	1.1	2
405TSTDCD4332	405TS	4	100	94.1	0.86	400	50	132	1024	1485	1.25	2
444TSTDCD4332	444TS	4	125	94.5	0.87	380	50	172	1348	1485	1.1	2
444TSTDCD4332	444TS	4	150	94.5	0.87	415	50	190	1481	1486	1.1	2
444TSTDCD4332	444TS	4	125	94.5	0.86	400	50	164	1281	1488	1.1	2
445TSTDCD4332	445TS	4	150	95	0.87	380	50	205	1618	1488	1.1	2
445TSTDCD4332	445TS	4	200	95	0.87	415	50	250	1975	1486	1	2
445TSTDCD4332	445TS	4	150	95.4	0.86	400	50	195	1537	1490	1.1	2
445TSTDCD14051	445TS	4	200	95.5	0.86	380	50	278	2157	1488	1	2
	445TS	4	250	95.4	0.86	415	50	316	2469	1486	0.8	1.75
	445TS	4	200	95.4	0.86	400	50	262	2049	1488	1	2
	447TS	4	300	95.4	0.86	380	50	414	3236	1480	0.8	1.75
	447TS	4	300	95.4	0.86	415	50	379	2963	1480	0.8	1.75
	447TS	4	300	95.4	0.86	400	50	394	3074	1480	0.8	1.75
	449TS	4	350	95.4	0.86	380	50	484	3775	1480	0.8	1.75
	449TS	4	350	95.4	0.86	415	50	443	3457	1480	0.8	1.75
	449TS	4	350	95.4	0.86	400	50	459	3586	1480	0.8	1.75
	449TS	4	400	95.4	0.86	380	50	553	4315	1480	0.8	1.75
	449TS	4	400	95.4	0.86	415	50	506	3951	1480	0.8	1.75
	449TS	4	400	95.4	0.86	400	50	525	4099	1480	0.8	1.75

DIESEL ENGINE DATA SHEET



- **HIGH SPEED DIESEL ENGINE**
- **PUMP SET FOR FIRE FIGHTING**
- **FIRE FIGHTING PUMP SYSTEM**

Power



Speiflcation Of Diesel Engines

Model	380	480B	485B	490B	4100	4102	4105 BZ	4108 BZ	6102 BQ	6102 BZQ	6102 BZQ	6112 T	6120 T	6120 TI	6126 TI-1	6126 TI-2
Type	VERTICAL , WATER-COOLED, FOUR- STROKE, DIRECTION- INJECTOR															
Number of cylinders	3	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6
Borestroke (mm)	80*90	80*90	85*95	90*100	90*105	102*118	102*118	108*118	102*118	102*118	102*118	112*135	120*130	120*130	126*130	126*130
Rate power (kw)	20	28	36	42	55	63.8	75	88	95	110	125	150	165	200	245	275
Rate power (hp)	27	38	49	57	75	84	102	120	130	150	170	204	225	272	334	374
Rate speed (r/min)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Total displacement (l)	1.357	1.809	2.156	2.54	3.298	3.857	4.087	4.324	5.785	5.785	5.785	7.98	8.82	8.82	9.73	9.73
Max. torque(n.m)	72.6	99.8	118.2	149.7	193.1	231.8	260	280	372	420	470	760	1250	1250	1640	1640
Min specific fuel Consumption at full load	247	247	262	247	238	238	238	238	205	205	205	201	201	201	203	203
Direction of crankshaft Rotation (facing to flywheel)	COUNTER-CLOCKWISE															
Lubrication method	PRESSURE AND SPLASH LUBRICATING															
Starting method	ELECTRIC STARTING															
Net mass (kg)	230	250	260	300	350	360	380	400	580	580	580	1200	1300	1300	1400	1400

JOCKEY PUMP DATA SHEET



RV.RVA
VERTICAL MULTISTAGE
CENTRIFUGAL PUMP
50HZ

Product introduction

Pump

RVA and RV are non-self priming vertical multistage centrifugal pump, the pumps are available with standard motor, the inlet and outlet are located at the pump bottom at the same plane (inline type).

All pumps are equipped with a maintenance-free mechanical seal set of the cartridge type.

Motor

RVA and RV are fitted with a totally enclosed fan-cooled 2-pole three-phase standard motor.

From 0.37kW to 2.2kW, are also available with single-phase motor. (1*220-230V/240V).

Motor Protection

Single-phase motor have a built-in thermal overload switch.

Three-phase motors must be connected to a motor protective circuit breaker according to local regulations.

Ambient temperature

Ambient temperature: maximum +40, if the ambient temperature exceeds +40, or the pump is installed at an altitude exceeding 1000 meters, the motor must not be fully loaded due to the risk of overheating.

Overheating may result from excessive ambient temperatures or the low density and consequently low cooling effect of the air.

In such cases, it may be necessary to use a motor with a higher rated output.

Terminal box positions

If necessary, disassembling the protective cover of the shaft connector, but did not disassembling the shaft connector.

Disassembling the motor fixation screws.

Turn the motor to the required direction.

2. Fasten the motor screws.

3. Install the shaft connector's protective cover.

4. The voltage and frequency are marked on the label, the correct power should be confirmed with the label before usage.

The voltage and frequency are marked on the label, the correct power should be confirmed with the label before usage.

To ensure the electric connection is conformity to the drawing marked on the label inside the terminal box.

Viscosity

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in the power consumption.

In such situations the pump should be fitted with a larger motor, if in doubt, contact.

Example:

From the Fig.3, the pump is installed at an altitude exceeding 1000 meters, P2 will decrease to 88%, if the ambient temperature is up to 70, P2 will decrease to 78%.

Fig.1 RVA

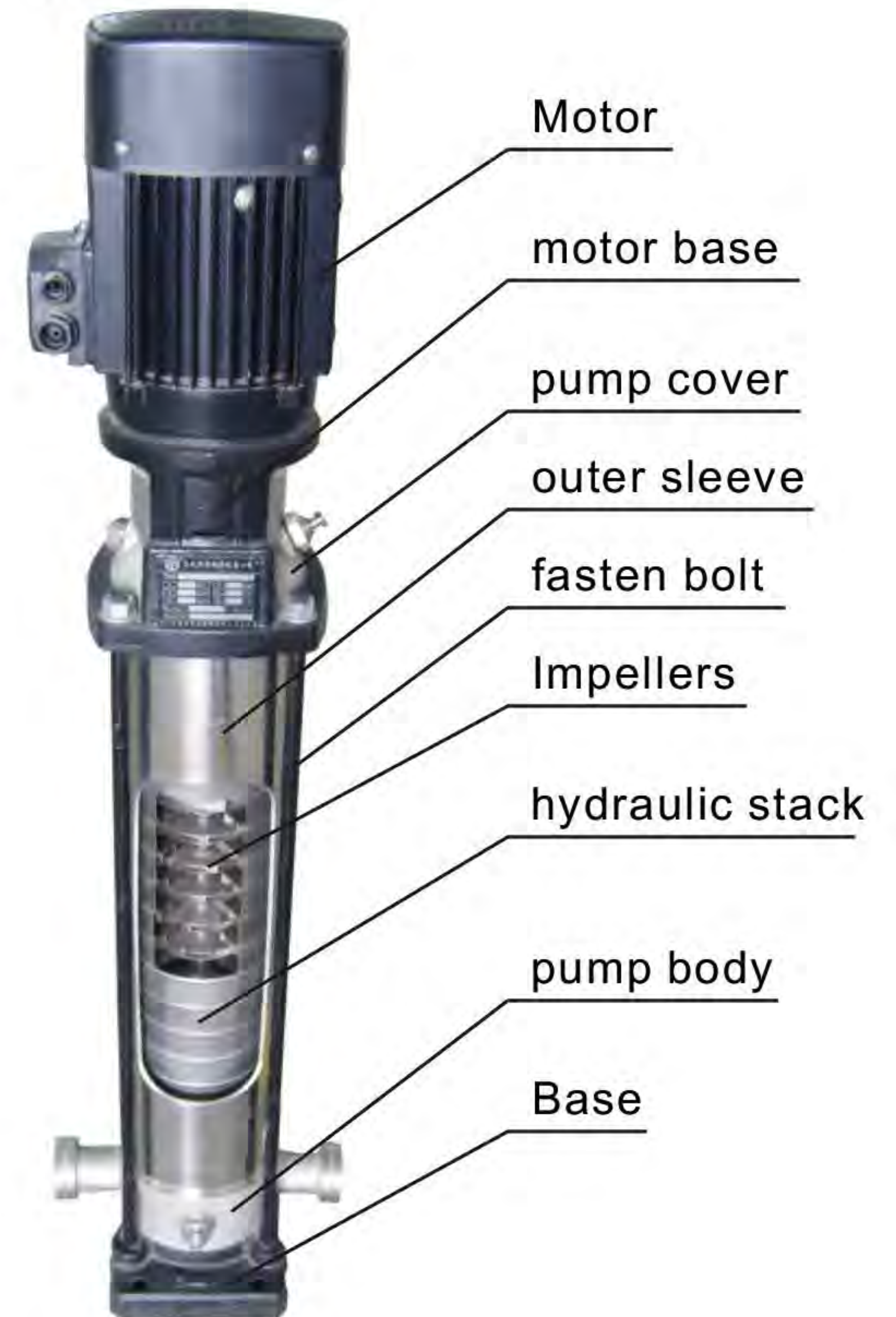


Fig2. Terminal box positions

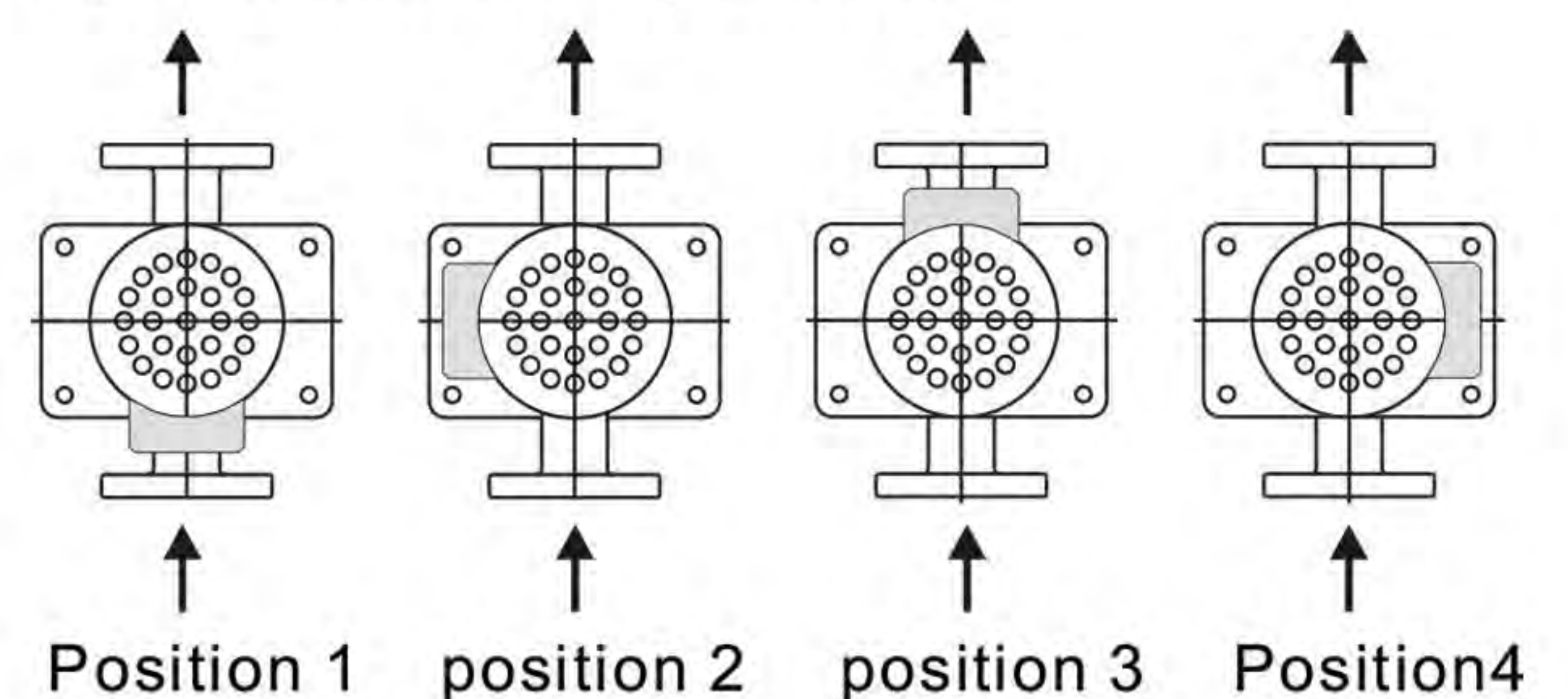
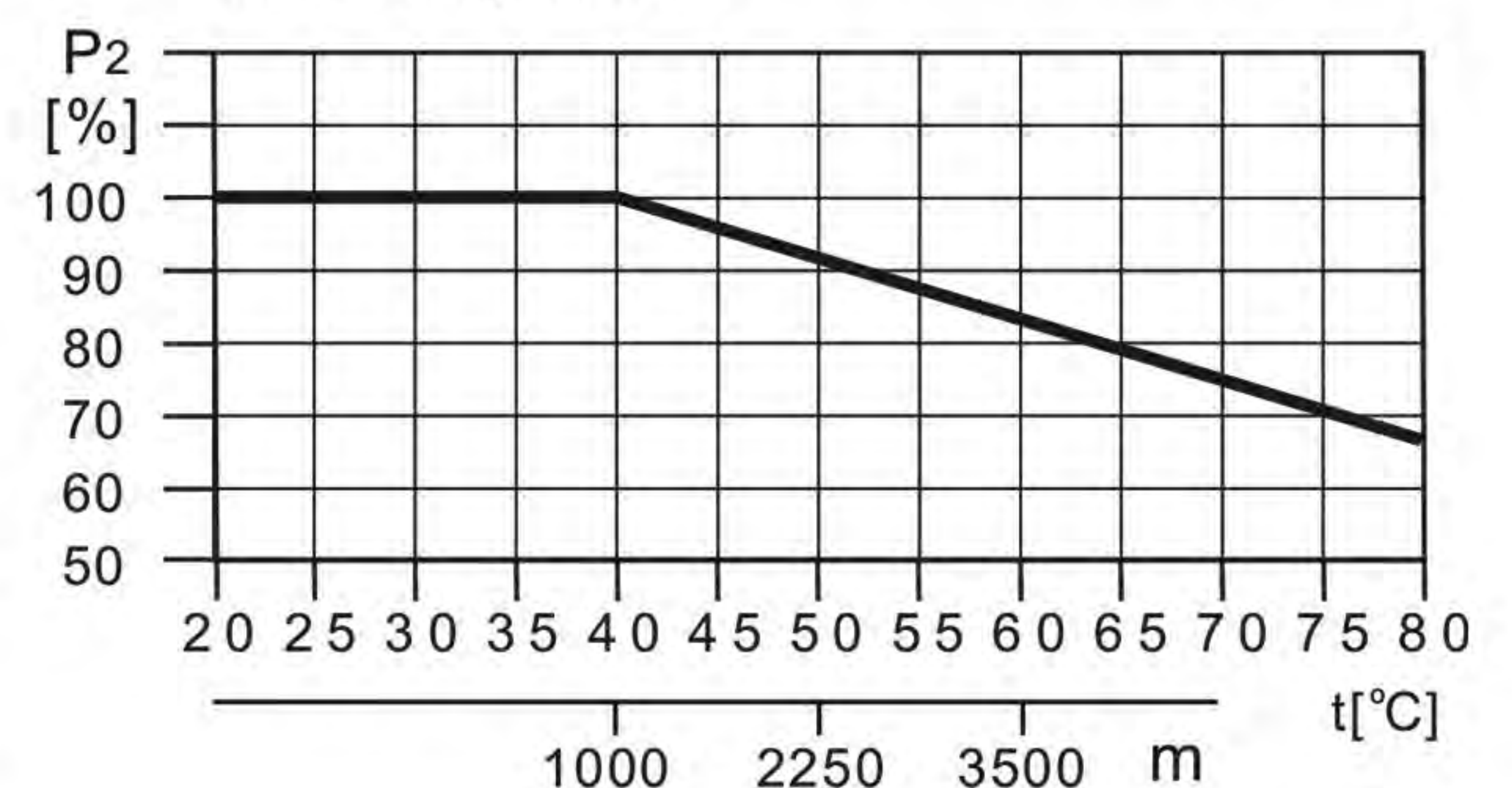


Fig.3 Relationship between motor output (P2) and temperature



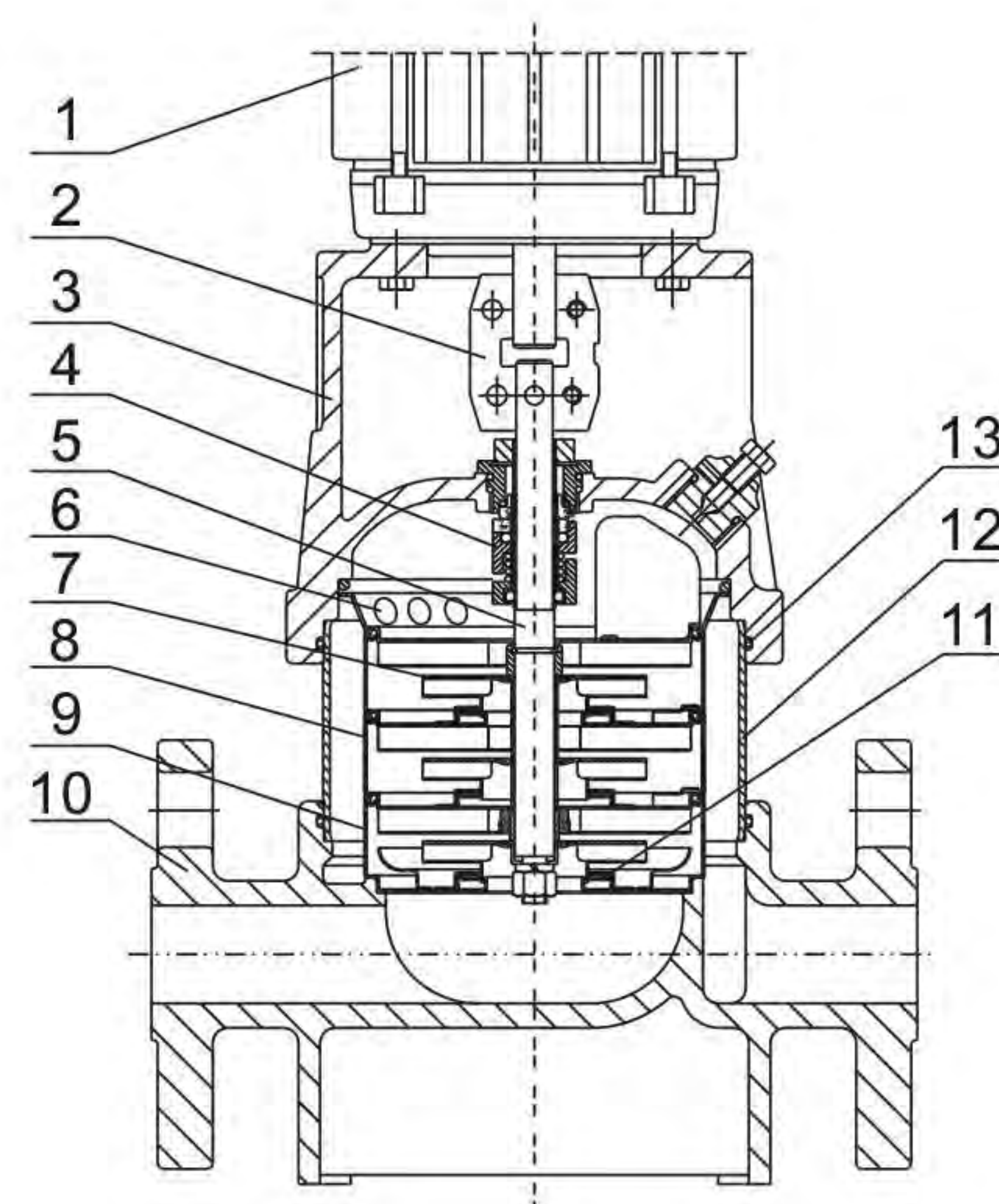
Construction

Vertical Multistage Centrifugal Pump

Material RV

No.	Description	Material	EN/DIN	AISI/ASTM
1	Motor			
2	Shaft connector			
3	Pump head	Cast iron	EN-JL 1030	ASTM25B
4	Mechanical seal			
5	Shaft	S.S		AISI420
6	Outlet	S.S	1.4301	AISI304
7	Impeller	S.S	1.4301	AISI304
8	Hydraulic stack	S.S	1.4301	AISI304
9	Inlet	S.S	1.4301	AISI304
10	Pump body	Cast iron	EN-JL 1030	ASTM25B
11	Neck ring	PTFE		
12	Outer sleeve	S.S	1.4301	AISI304
13	O-ring	EPDM/FKM		

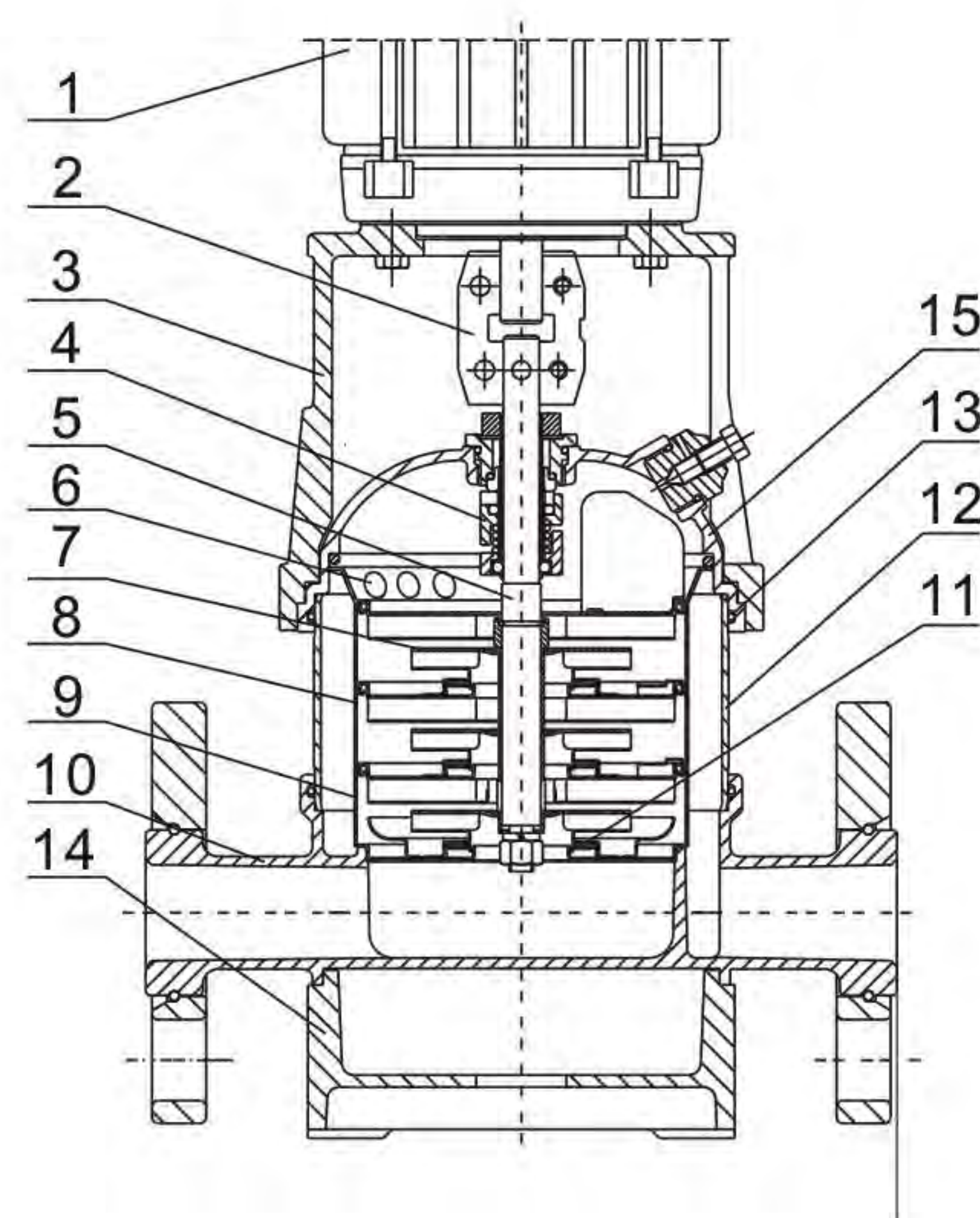
RV1,2,3,4,5
Sectional drawing



Material RVA

No.	Description	Material	EN/DIN	AISI/ASTM
1	Motor			
2	Shaft connector			
3	Pump head	Cast iron	EN-JL 1030	ASTM25B
4	Mechanical seal			
5	Shaft	S.S	1.4057	AISI431
6	Outlet	S.S	1.4301	AISI304
7	Impeller	S.S	1.4301	AISI304
8	Hydraulic stack	S.S	1.4301	AISI304
9	Inlet	S.S	1.4301	AISI304
10	Pump body	S.S	1.4301	AISI304
11	Neck ring	PTFE		
12	Outer sleeve	S.S	1.4301	AISI304
13	O-ring	EPDM/FKM		
14	Bottom base	Cast iron	EN-JL 1030	ASTM25B
15	Pump cover	S.S	1.4301	AISI304

RVA1,2,3,4,5
Sectional drawing



Operating and inlet pressures

Vertical Multistage Centrifugal Pump

Maximum operating pressure and temperature range

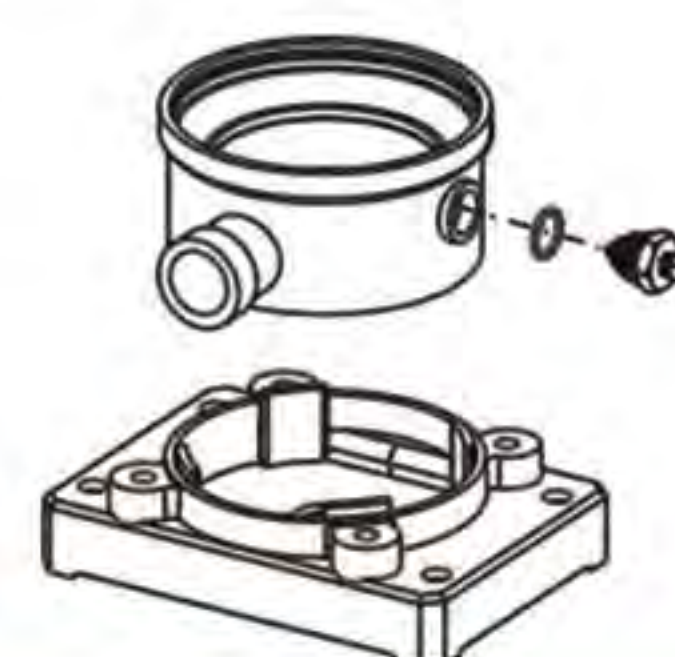
DIN-FGJ



UNION



PJE



Max. permissible operating pressure

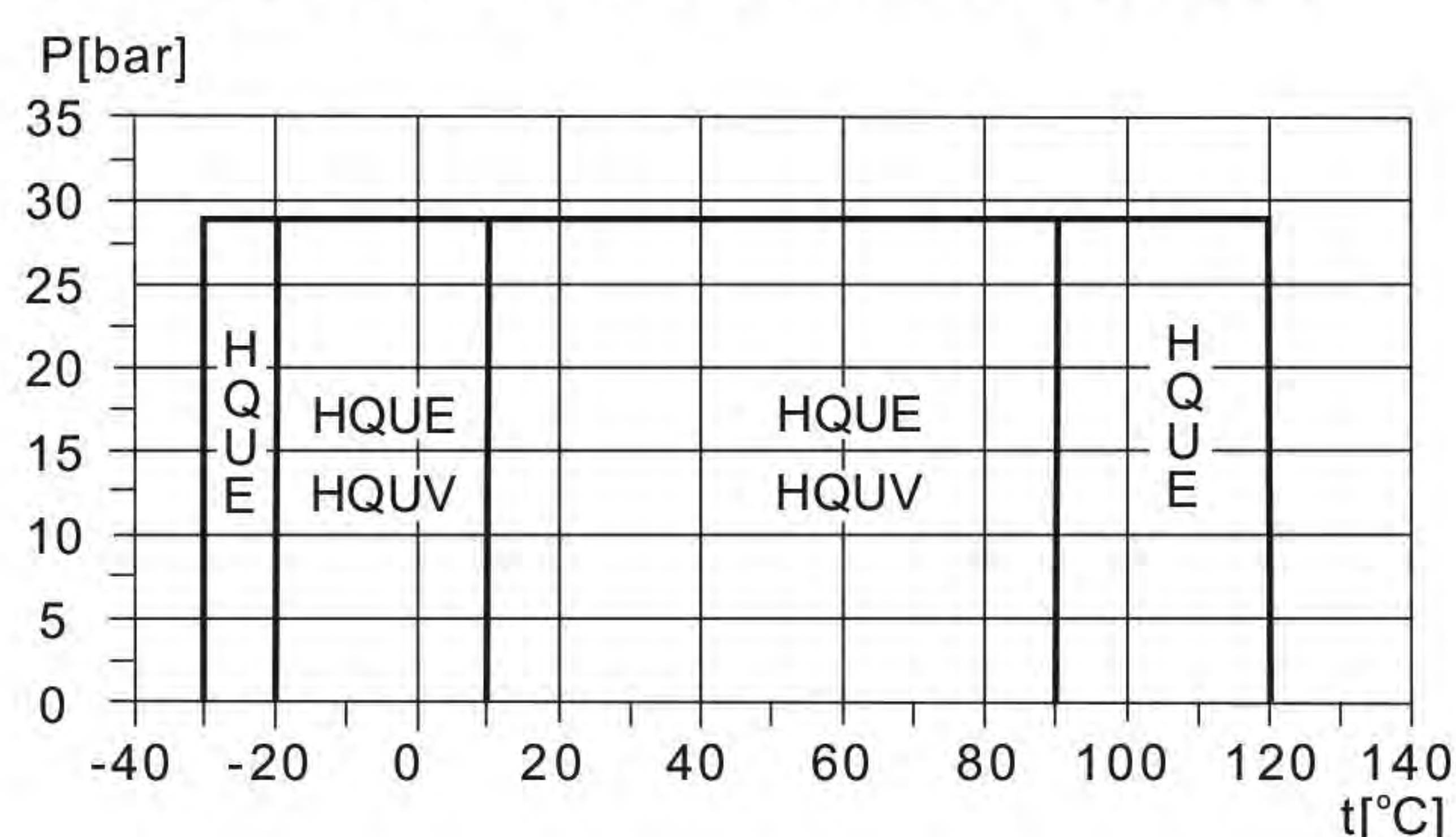
Liquid temperature range

RV,RVA1	25bar	-20 C to +104 C
RV,RVA2	25bar	-20 C to +104 C
RV,RVA3	25bar	-20 C to +104 C
RV,RVA4	25bar	-20 C to +104 C
RV,RVA5	25bar	-20 C to +104 C
RV,RVA10-1 RV,RVA10-10	16bar	-20 C to +104 C
RV,RVA10-12 RV,RVA10-17	25bar	-20 C to +104 C
RV,RVA15-1 RV,RVA15-8	16bar	-20 C to +104 C
RV,RVA15-9 RV,RVA15-12	25bar	-20 C to +104 C
RV,RVA20-1 RV,RVA20-7	16bar	-20 C to +104 C
RV,RVA20-8 RV,RVA20-10	25bar	-20 C to +104 C
RV,RVA32-1-1 RV,RVA32-5	16bar	-20 C to +104 C
RV,RVA32-6-2 RV,RVA32-8	25bar	-20 C to +104 C
RV,RVA32-9-2 RV,RVA32-10-2	30bar	-20 C to +104 C
RV,RVA45-1-1 RV,RVA45-4	16bar	-20 C to +104 C
RV,RVA45-5-2 RV,RVA45-6-1	25bar	-20 C to +104 C
RV,RVA45-6 RV,RVA45-7	30bar	-20 C to +104 C
RV,RVA64-1-1 RV,RVA64-3	16bar	-20 C to +104 C
RV,RVA64-4-2 RV,RVaA64-5-2	25bar	-20 C to +104 C
RV,RVA90-1-1 RV,RVA90-3	16bar	-20 C to +104 C
RV,RVA90-4-2	25bar	-20 C to +104 C

Operating range of the shaft seal

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The range shown in fig 4. Applies to clean water and water with glycol liquids.

Fig.4 Operating range of standard shaft seals



Selection and sizing

Vertical Multistage Centrifugal Pump

Minimum inlet pressure-NPSH

Calculation of the inlet pressure "H" is recommended in these situations :

- the liquid temperature is high.
- the flow is significantly higher than the rated flow.
- water is drawn from depths.
- water is drawn through long pipes.

inlet conditions are poor. o avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump.

The maximum suction lift "H" in metres head can be calculated as follows:

$$H = P_b \cdot 10.2 - \text{NPSH} - H_f - H_v - H_s$$

Pb = Barometric pressure in bar.

(Barometric pressure can be set to 1 bar).

in closed systems, Pb indicates the system pressure in bar.

NPSH = Net positive suction Head in metres head.

(To be read from the NPSH curve at the highest flow the pump will be delivering)

Hf = Friction loss in suction pipe(unit:m).

(At the highest flow the pump will be delivering.)

Hv = Vapour pressure (unit:m).

(To be read from the vapour pressure scale).

Hs = safty margin=minimum 0.5 metres head.

If the "H" calculted is positive,the pump can operate at a suction lift of maximum "H" metres head. If the "H" calculted is negative, an inlet pressure of minimum "H" metres head is required.

Example:

Pb=1bar

pump model:RVA10,50Hz

flow: 10m /h

NPSH(P36 reference:2.1 metres head.

liquid temperature:+50C

Hv(reference picture4):1.3metres head.

$$H = P_b \cdot 10.2 - \text{NPSH} - H_f - H_v - H_s$$

$$H = 1 \cdot 10.2 - 2.1 - 3.0 - 1.3 - 0.5 = 3.3(\text{metres})$$

It means the pump can operate at a suction lift of maximum 3.3 metres head.

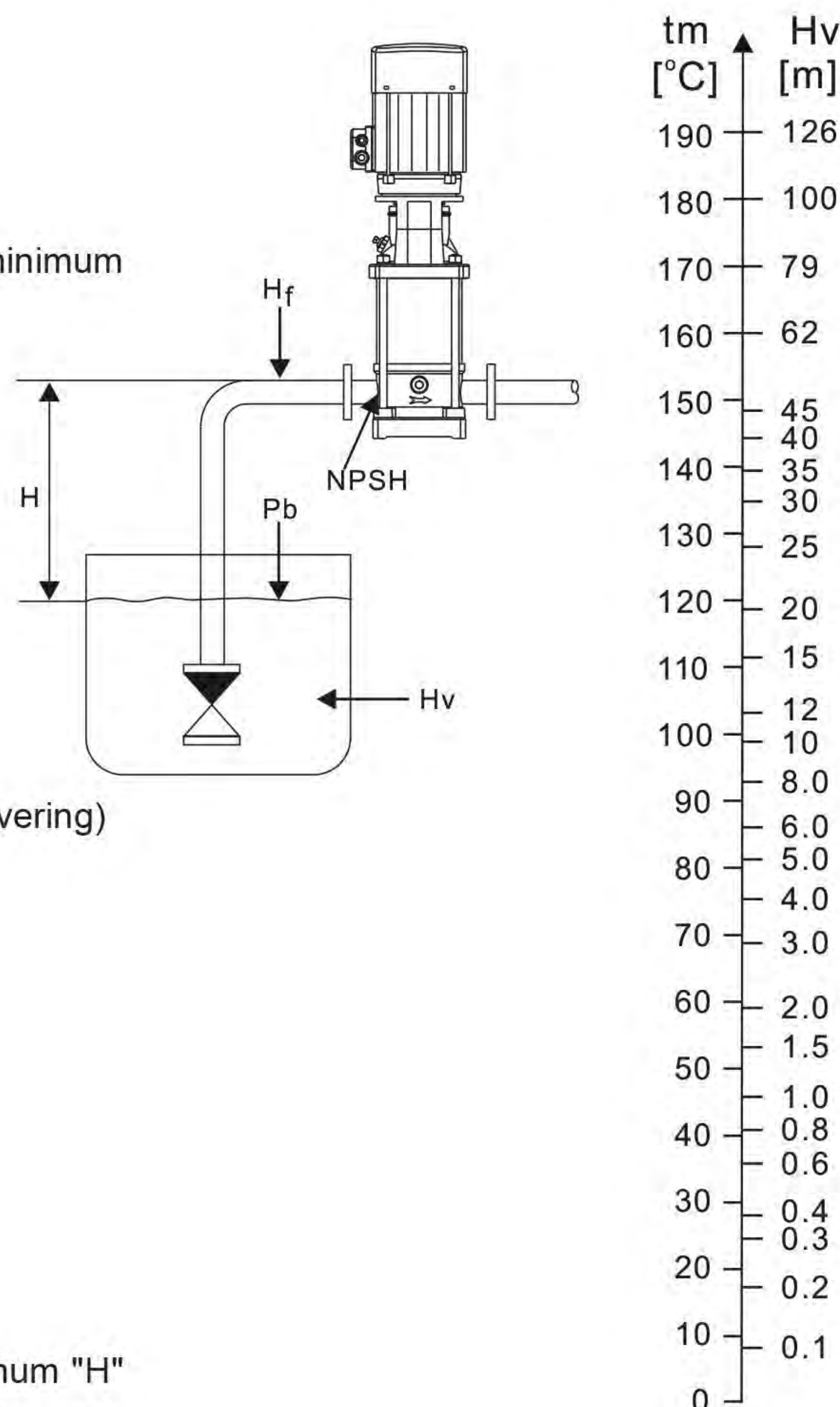
exchaged meter head to bar:

$$1 \text{ metre head} = 1 \cdot 0.0981 = 0.0981 \text{ bar}$$

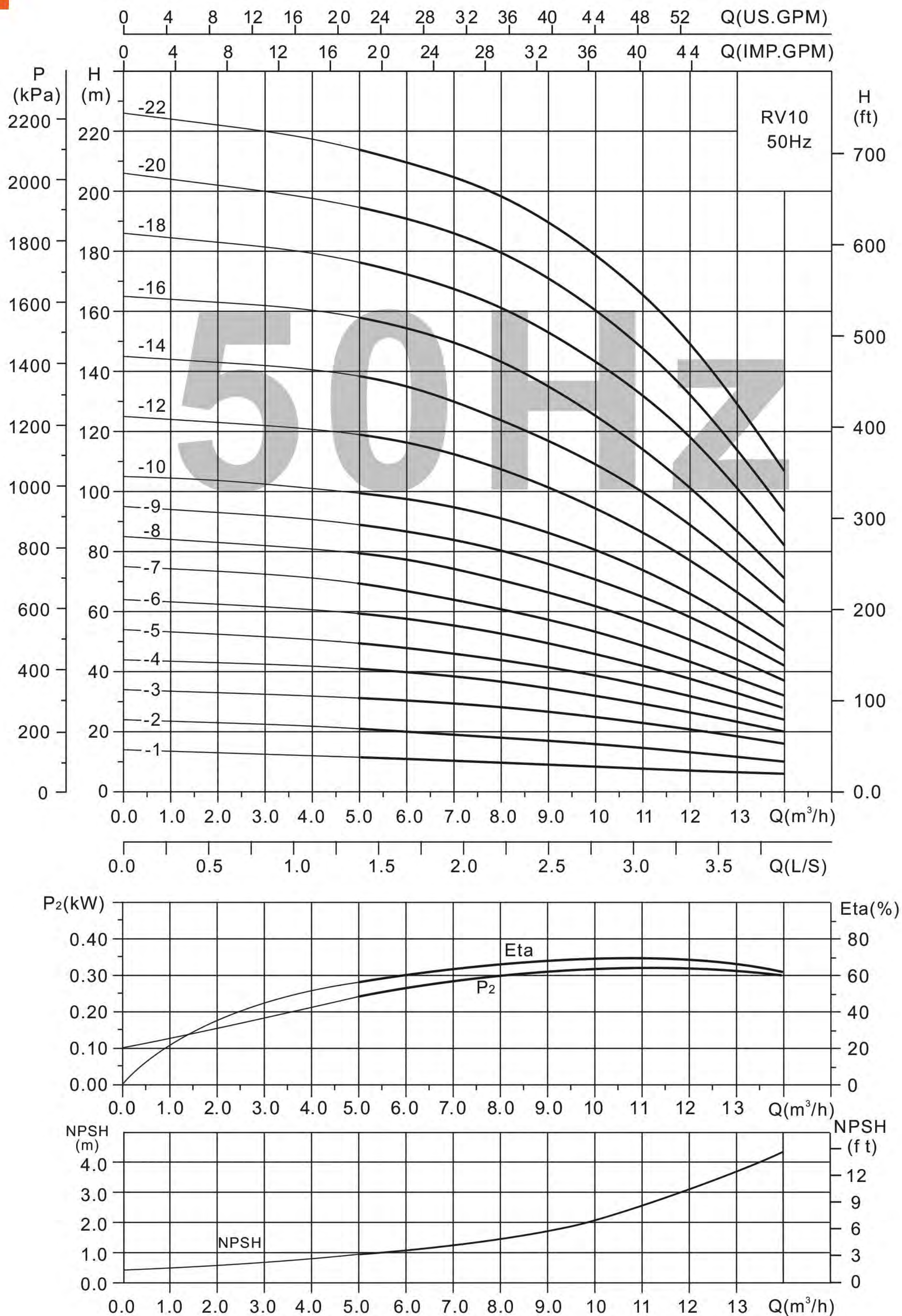
exchaged metre head to kpa:

$$1 \text{ metre head} = 1 \cdot 9.81 = 9.81 \text{ kpa.}$$

Fig.13 Mimimum inlet pressure-NPSH



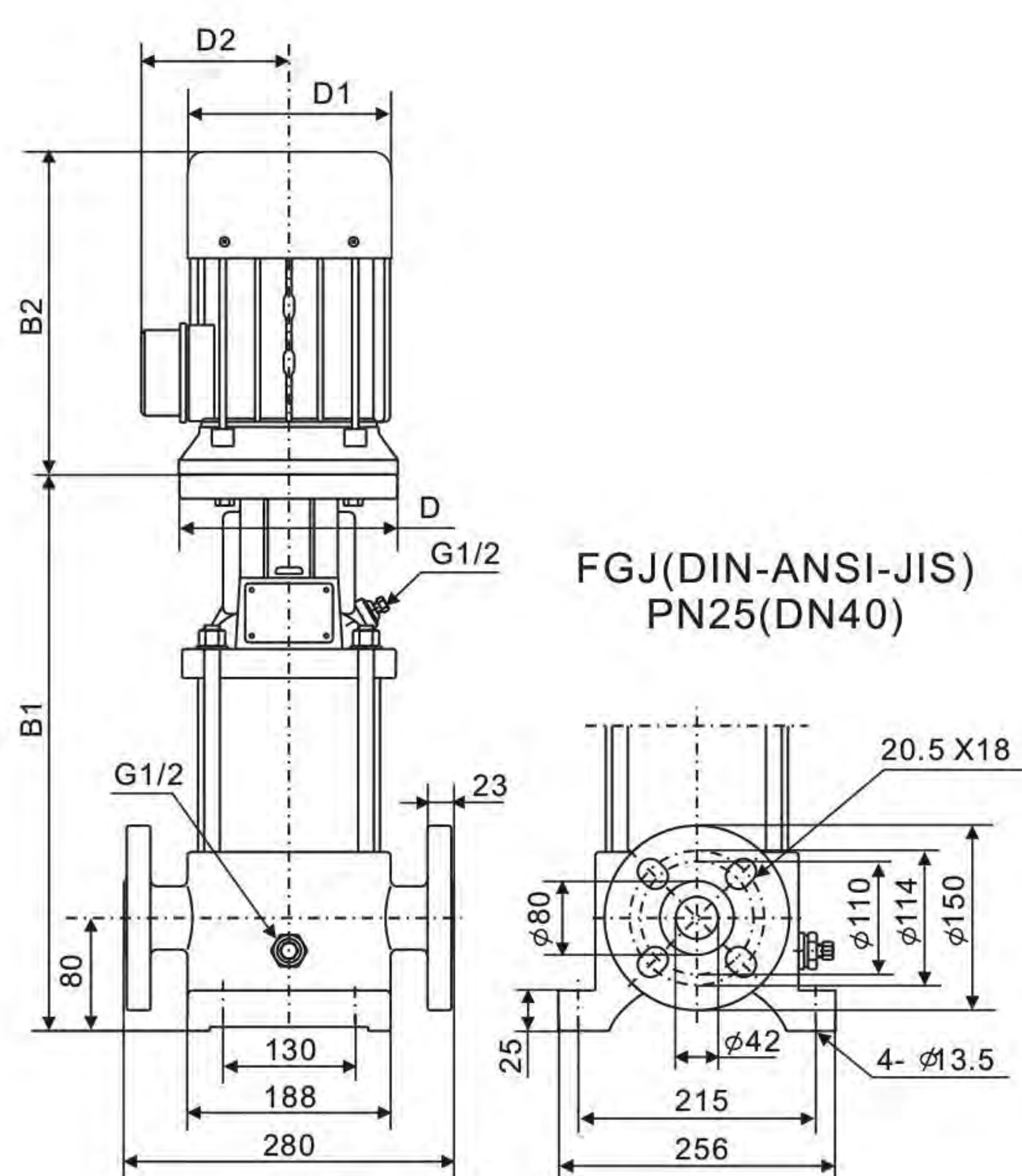
Performance Curve



Performance table

Model	Power P ₂ (kW)	Q (m ³ /h)	2.0	4.0	6.0	8.0	10	12	14
RV10-1	0.37	H (m)	13	12	11	9.5	8.5	7	6
RV10-2	0.75		23	22	20	18	16	13	10
RV10-3	1.1		33	32	31	28	25	21	16
RV10-4	1.5		43	42	40	37	32	27	20
RV10-5	2.2		53	51	48	44	39	32	24
RV10-6	2.2		62	61	58	53	46	38	28
RV10-7	3.0		73	72	67	61	54	43	32
RV10-8	3.0		83	81	78	71	62	51	37
RV10-9	3.0		93	91	87	81	71	59	42
RV10-10	4.0		104	101	98	91	81	67	47
RV10-12	4.0		123	121	117	108	95	78	55
RV10-14	5.5		143	141	136	124	110	90	63
RV10-16	5.5		163	161	154	143	125	102	71
RV10-18	7.5		183	179	173	161	144	118	82
RV10-20	7.5		202	198	191	180	160	133	93
RV10-22	7.5		222	217	209	198	178	149	106

Installation sketch



Dimensions and weights

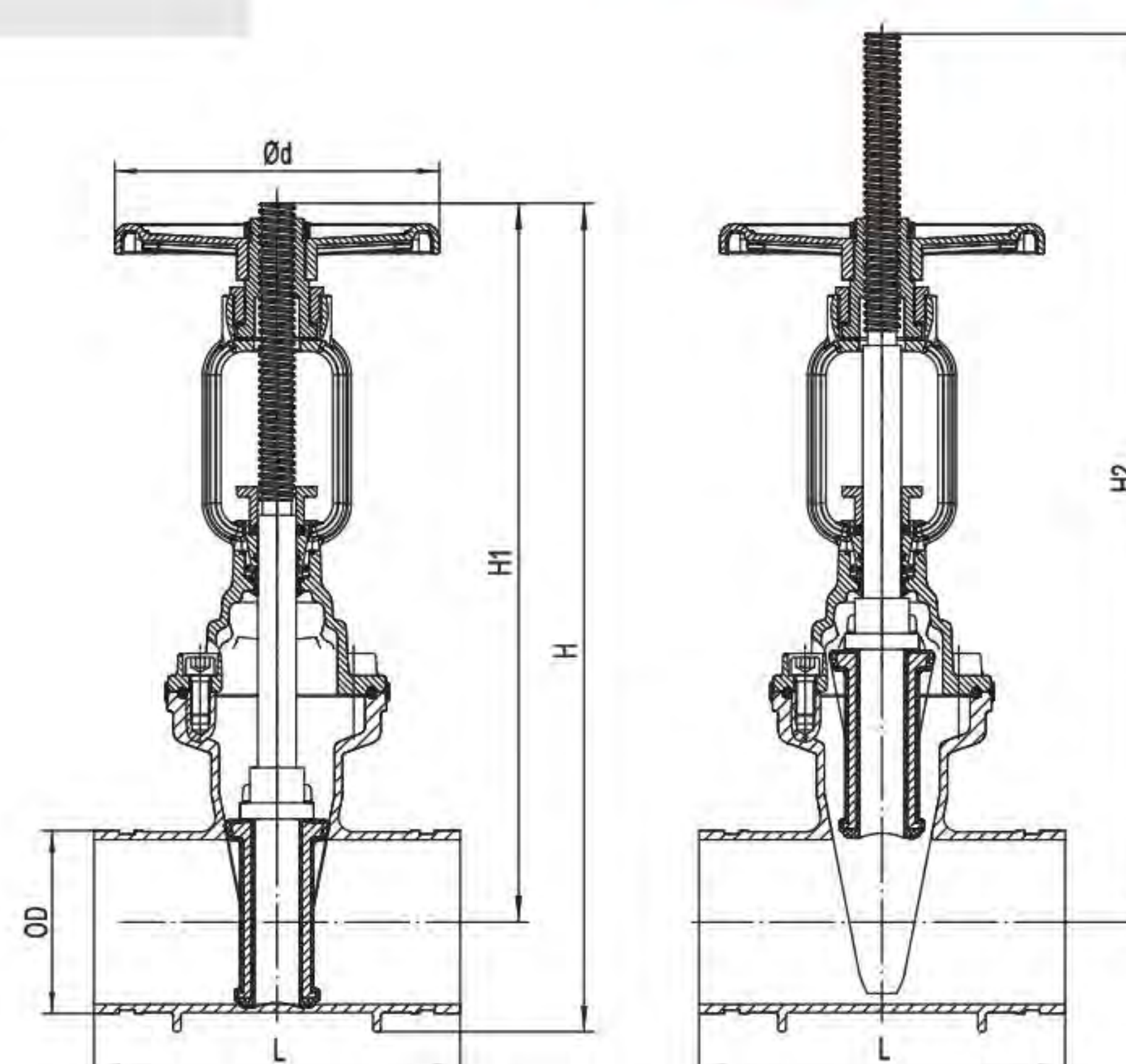
Model	Dimensions(mm)						Weight (kg)
	B1	B2	B1+B2	D	D1	D2	
RV10-1	322	205	527	—	133	102	38
RV10-2	352	205	557	—	133	102	40
RV10-3	388	241	629	—	154	111	43
RV10-4	418	241/293	659/711	—	154	111	50
RV10-5	456	275/293	731/749	—	177	116	53
RV10-6	486	275/293	761/779	—	177	116	55
RV10-7	516	293	791	—	177	116	60
RV10-8	546	293	818	—	177	116	61
RV10-9	576	293	848	—	177	116	63
RV10-10	626	305	931	—	197	148	65
RV10-12	686	305	991	—	197	148	68
RV10-14	761	390	1151	300	275	210	98
RV10-16	821	390	1211	300	275	210	100
RV10-18	881	390	1271	300	275	210	125
RV10-20	941	390	1331	300	275	210	128
RV10-22	1001	390	1361	300	275	210	130

VALVES

DATA SHEET

Resilient seated os& y gate valve- grooved end

Name of parts	Material
Body	ductile iron
Wedge	ductile iron+epdm
Stem nut	bronze
Stem	ss431 or ss304 , ss316, bronze
Bonnet	ductile iron
Bonnet gasket	epdm
Sealing ring	epdm
Yoke	ductile iron
Sliding disc	bronze
Screw	carbon steel with hot galvanization
O-rings	epdm
Hadwheel	ductile iron



Technical data

Size : dn50/60-dn200/219

working pressure : pn25,36

Valve standard: awwwa c515

Grooved standard : awwwa c606

temperature range : 0-80c

Dimensions		Pressure rating	Size (mm)					
DN	inch	psi	OD	L	H1	H2	H	Φd
50	2	362	60.3	178	358.5	420.5	403.5	203
65	2.5	362	73	190	359.5	429.5	411	203
			76.1					
80	3	362	88.9	203	378	462	437.5	203
100	4	362	114.3	229	449.5	553	518.5	203
125	5	362	139.7	254	549.5	677	631	300
			141.3					
150	6	362	165.1	267	591.5	747	686	300
			168.3					
200	8	362	219.1	292	735.5	938	865	330

Swing check valve with grooved end

Name of parts	Material
Body	Ductile iron
Seat Ring	Bronze
disc Sealing Ring	EPDM
disc Plate	SS304
Disc	Ducile iron
Clapper Arm	Ductile iron
Bonnet Gasket	Epdm
bonnet	Ductile iron
Hinge Pin	SS304
Hinge Bushing	Bronze
hinge plug	SS304



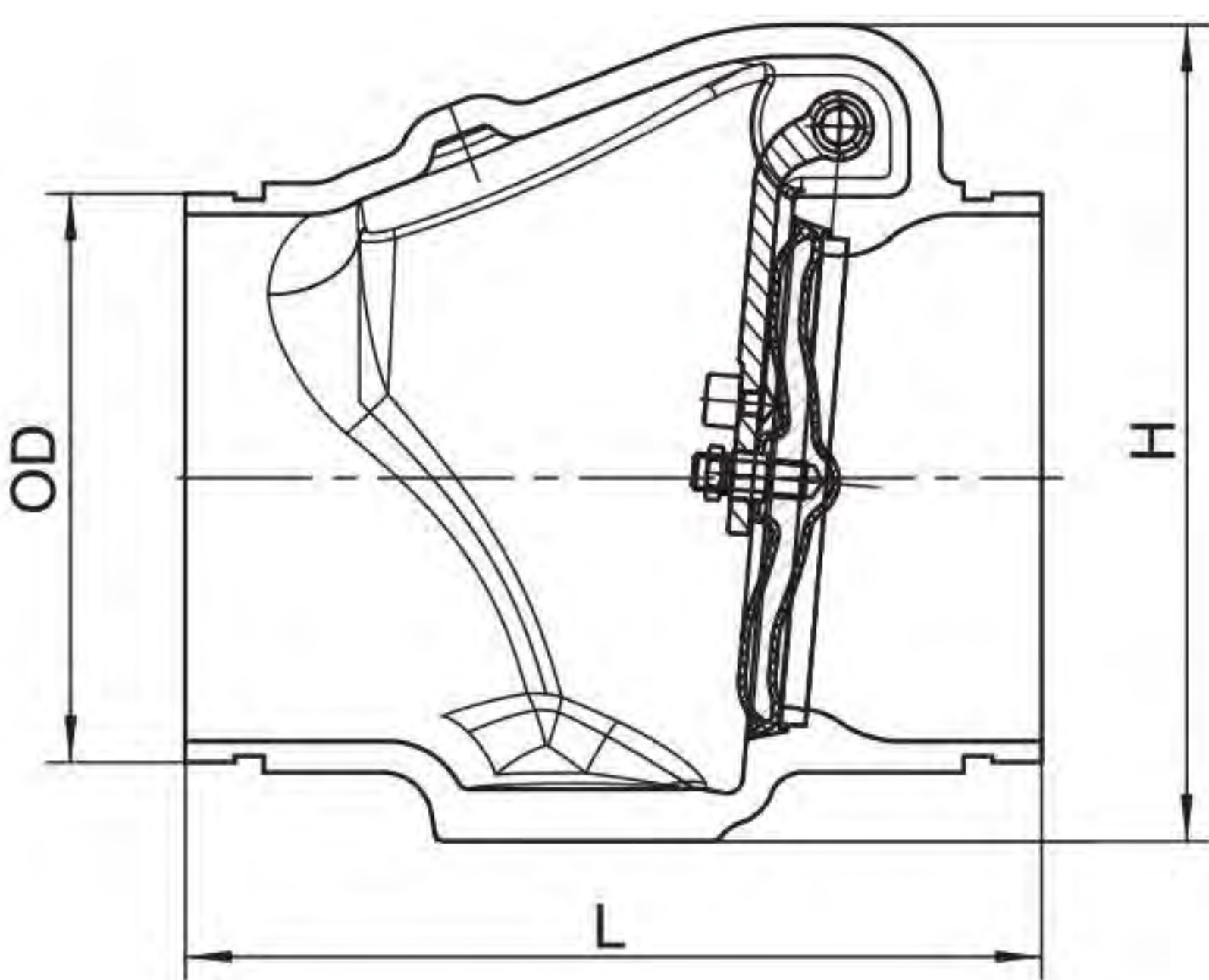
Technical date

Size : 2"~12"

working pressure : 362 PSI

Grooved standard: awwa c606

Temperature range : 0-80c

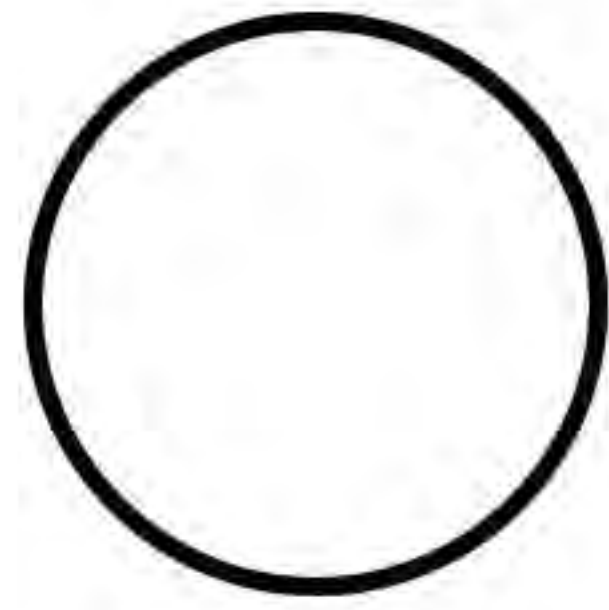


Dimensions		Pressure rating	Size (mm)		
DN	inch	psi	OD	L	H
50	2	362	60.3	167	122.5
65	2.5	362	73	180	136.5
			76.1		
80	3	362	88.9	198	165.5
100	4	362	114.3	229	193.6
125	5	362	139.7	254	235.5
			141.3		
150	6	362	165.1	272	252
			168.3		
200	8	362	219.1	330	314.5

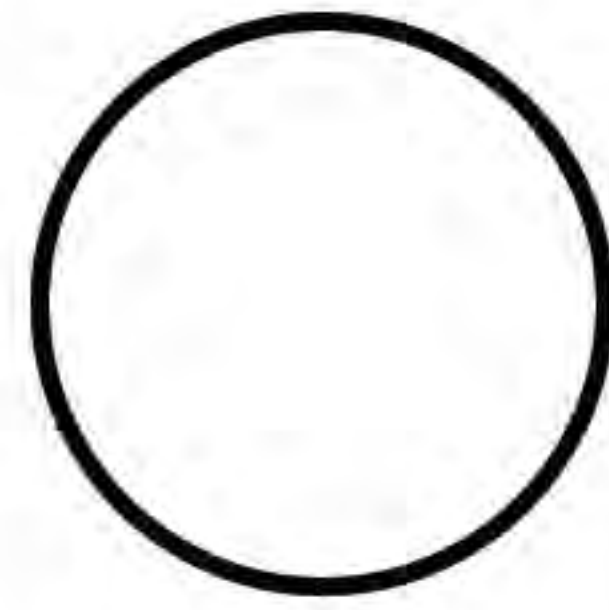
CONTROL PANELS

Wiring Diagrams

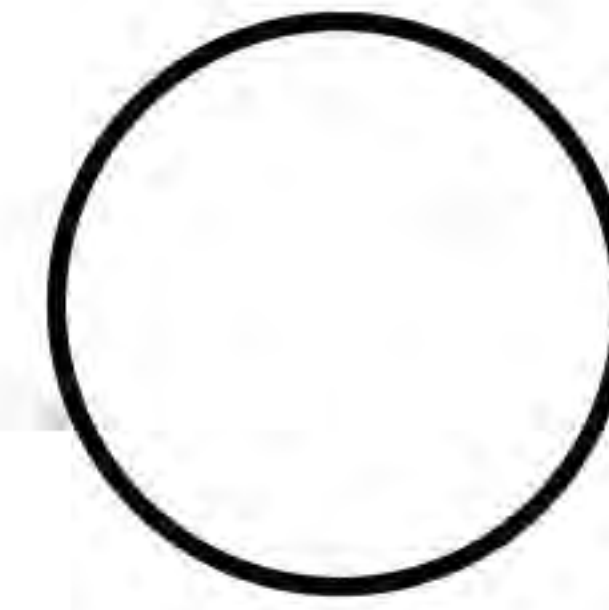
**PHASE
SEQUENCE OK**



**OVER LOAD
TRIP**

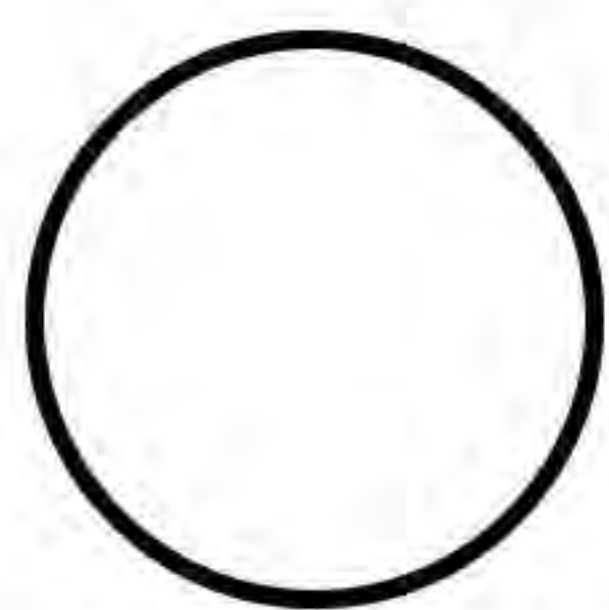


**PHASE
SEQUENCE ERR**



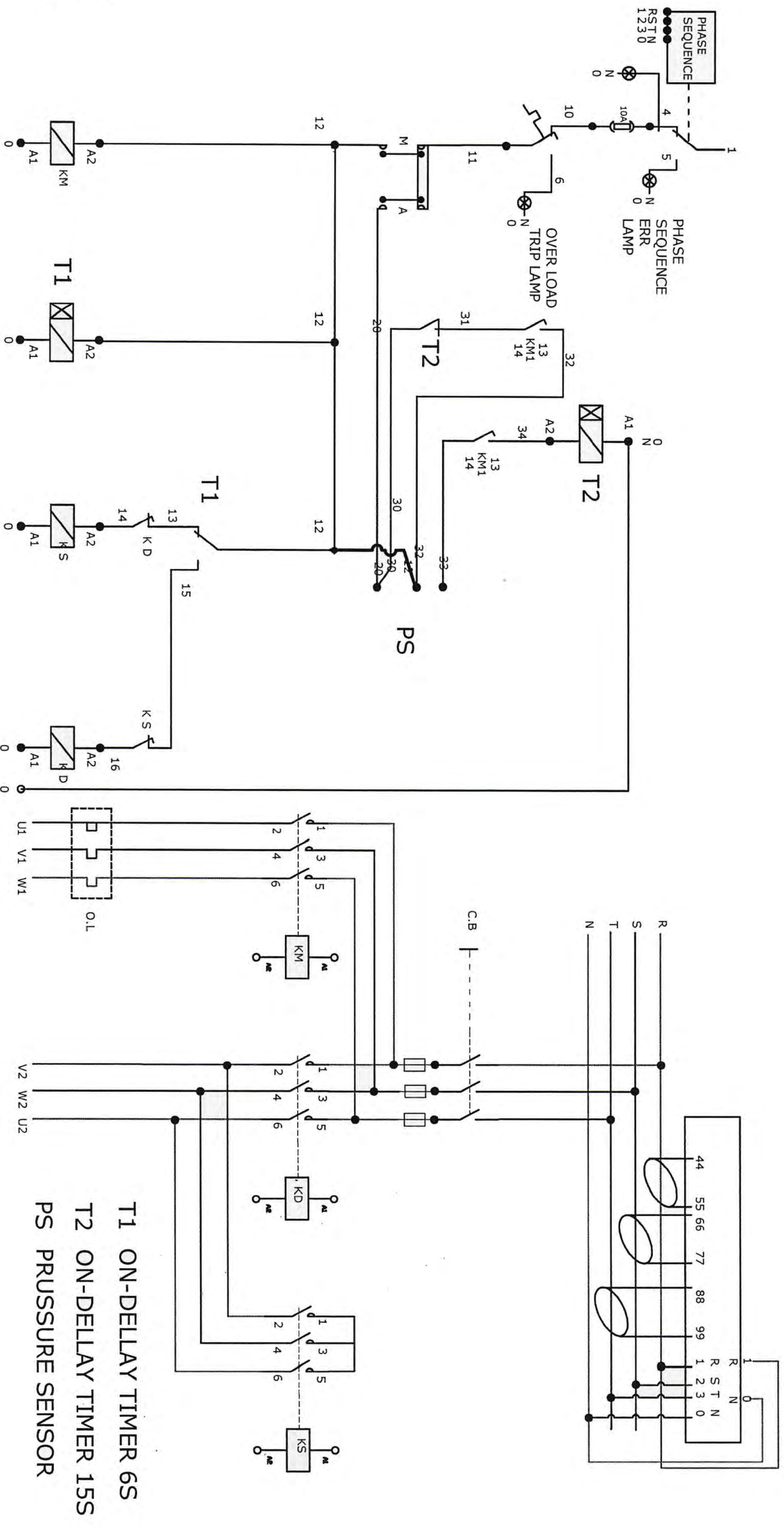
**ENRGE
METTER**

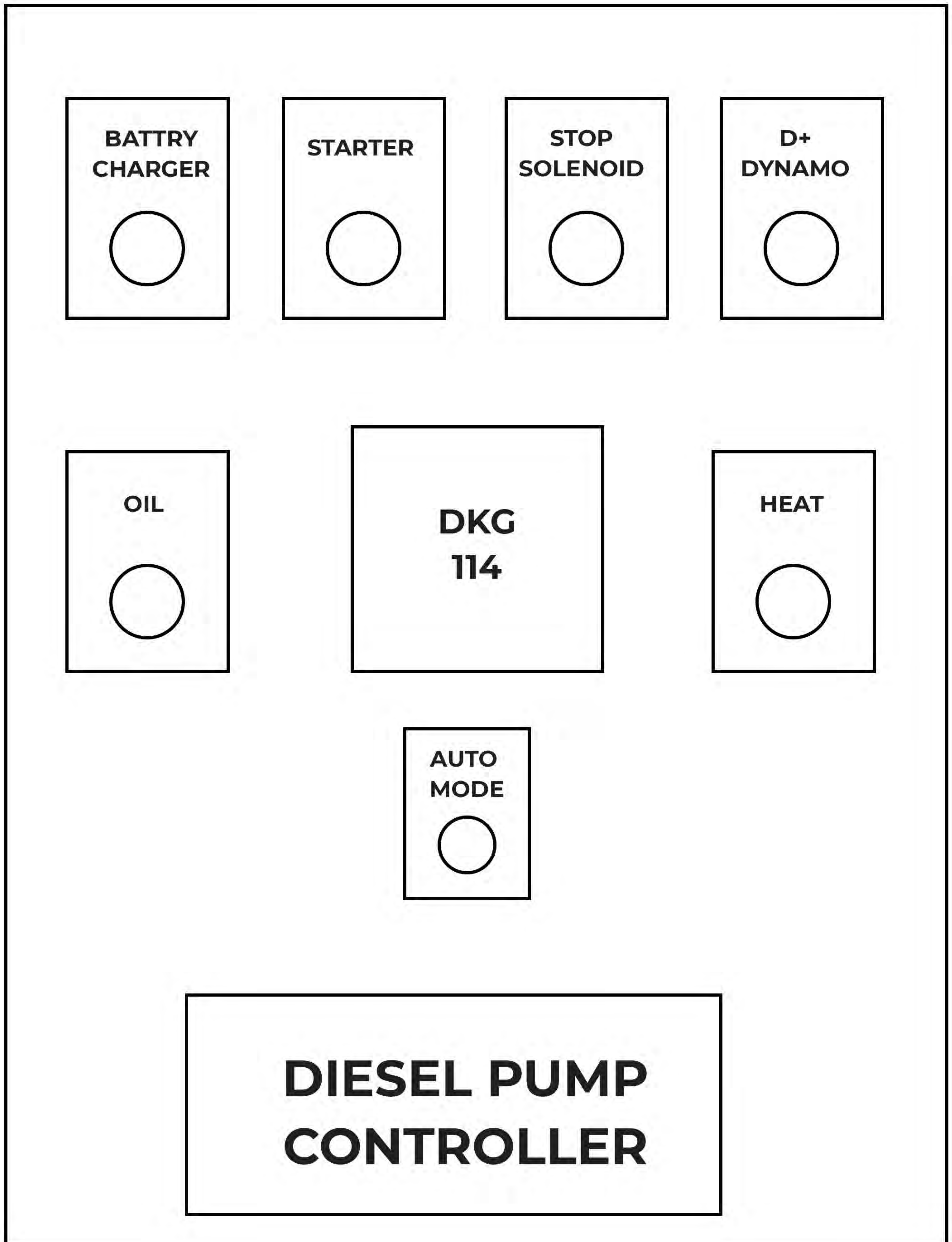
A-0-M

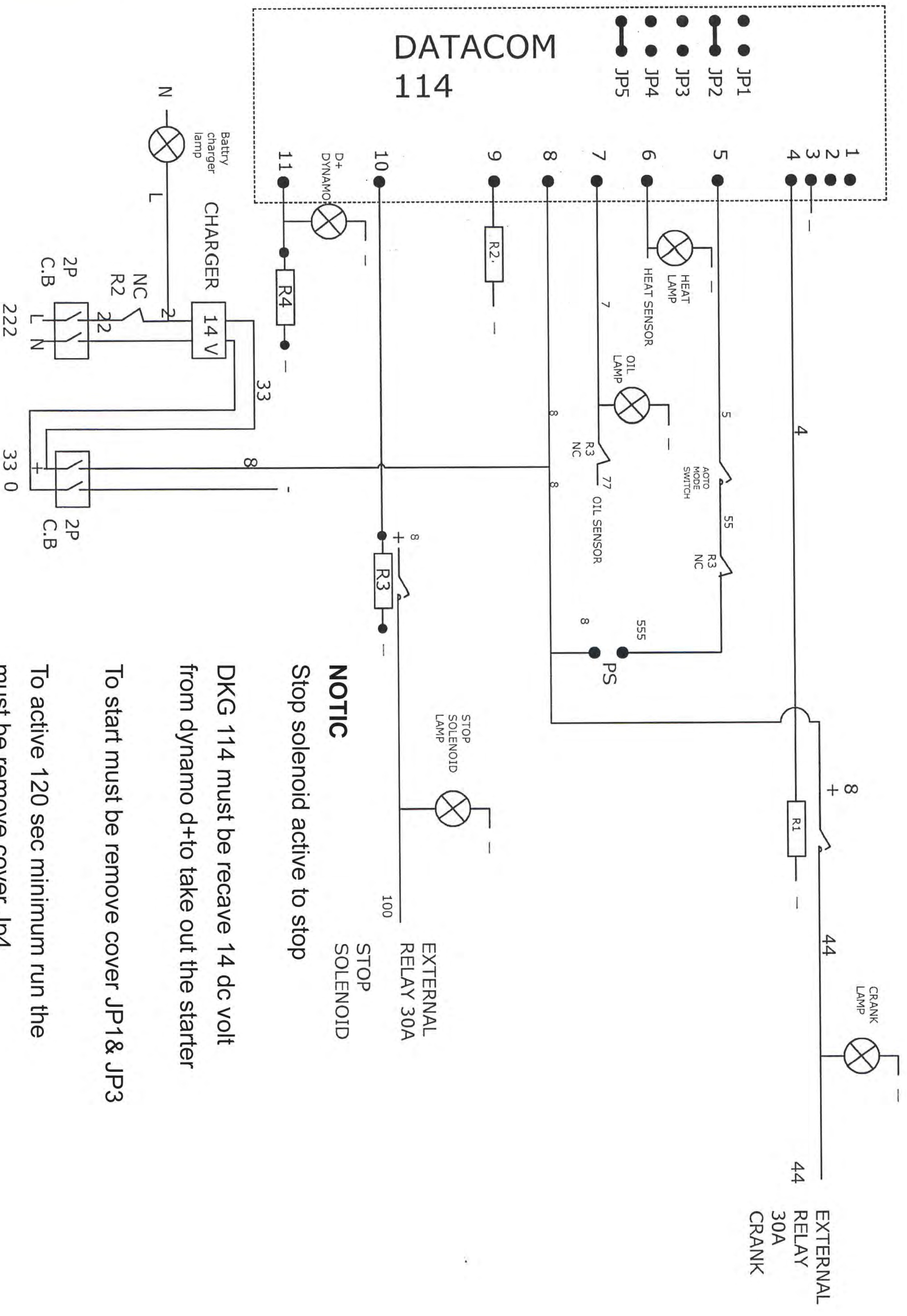


Electric pump control panel

Star delta with minimum run time







NOTIC

Stop solenoid active to stop

DKG 114 must be recave 14 dc volt from dynamo d+to take out the starter

To start must be remove cover JP1& JP3

To active 120 sec minimum run the must be remove cover Jp4



Egypt Head Office Address

3A arab organization for
industrialization bulidings,
makram abeed street 10th
floor, Cairo , Egypt

CONTACT US

☎ +202 23494024
+202 23494024
☎ +201017474300
☎ +201017474300

UAE Branch Office Address

Bayan Business Center
Dubai investment park first,
297-0, united Arab Emarets

✉ Sales@fire-degree.com
✉ Marketing@fire-degree.com
✉ Dubia@fire-degree.com
✉ Logistics@fire-degree.com

www.fire-degree.com