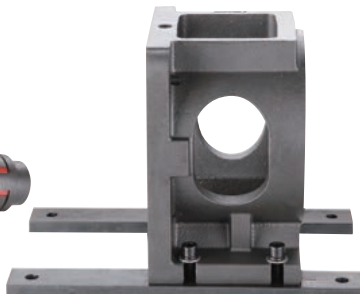


Standard Configuration



Servo Motor



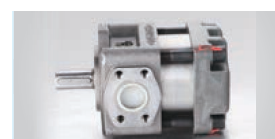
Stand Shaft Coupling



Albert Pin-type Servo Pump



Eckerle (internal gear pump)



Gear Pump



Inverter Delta



Braking Unit



Braking Resistor



Delta PG Card



Pressure Sensor Gefran



Encoder Cable



Toroidal Core



Signal Converting Board



Confluence Communication Card

Optional Accessories



Electric Reactor



Filter



Proportion Valve



Oil Port Flange

Structure of a Hydraulic Servo System



PLC

Controllo tutti i parametri
del macchinario

SET DI PRESSIONE
0÷10V

SET DI VELOCITÀ
0÷10V



INVERTER

Riceve i parametri del motore e
del sensore di pressione

FEEDBACK
0÷10V



PRESSURE SENSOR

SEGNALE ENCODER

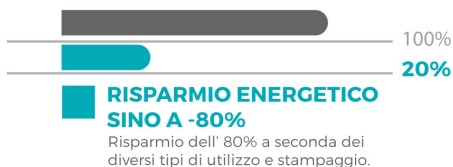


MOTORE BRUSHLESS

Hydraulic Energy System Features

RISPARMIO ENERGETICO

INIEZIONE
TRADIZIONALE
**SISTEMA CON
SERVOMOTORE**



INIEZIONE
TRADIZIONALE
**SISTEMA CON
SERVOMOTORE**



RISPARMIO ENERGETICO

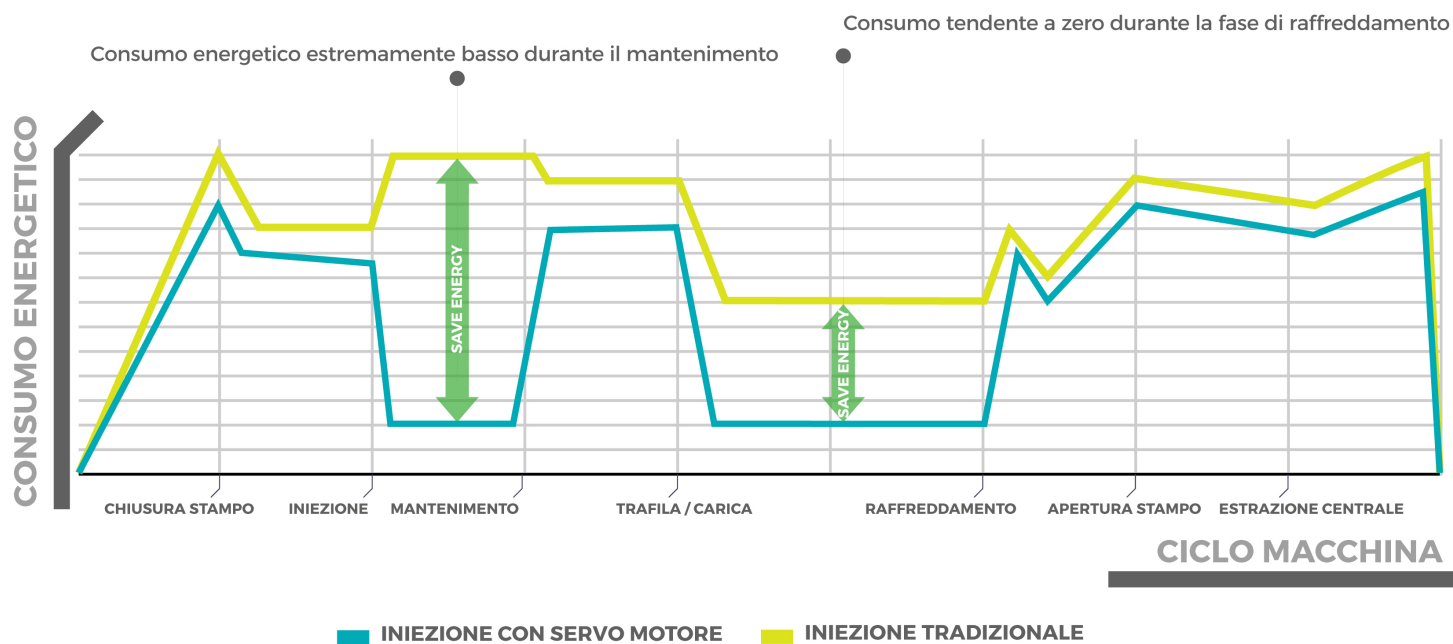
Salva fino al 80% di Energia Elettrica in più comparata a una tradizionale pressa a iniezione.



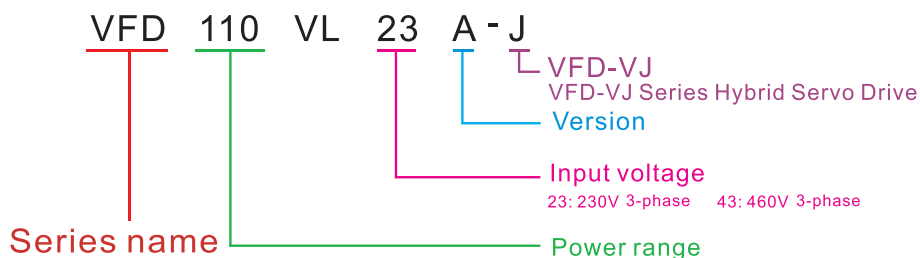
BASSE TEMPERATURE

Riduce la temperatura di 5-10° C per risparmiare sui costi di raffreddamento

Operation Perfomance



Model Explanation of Hybrid Servo Drive

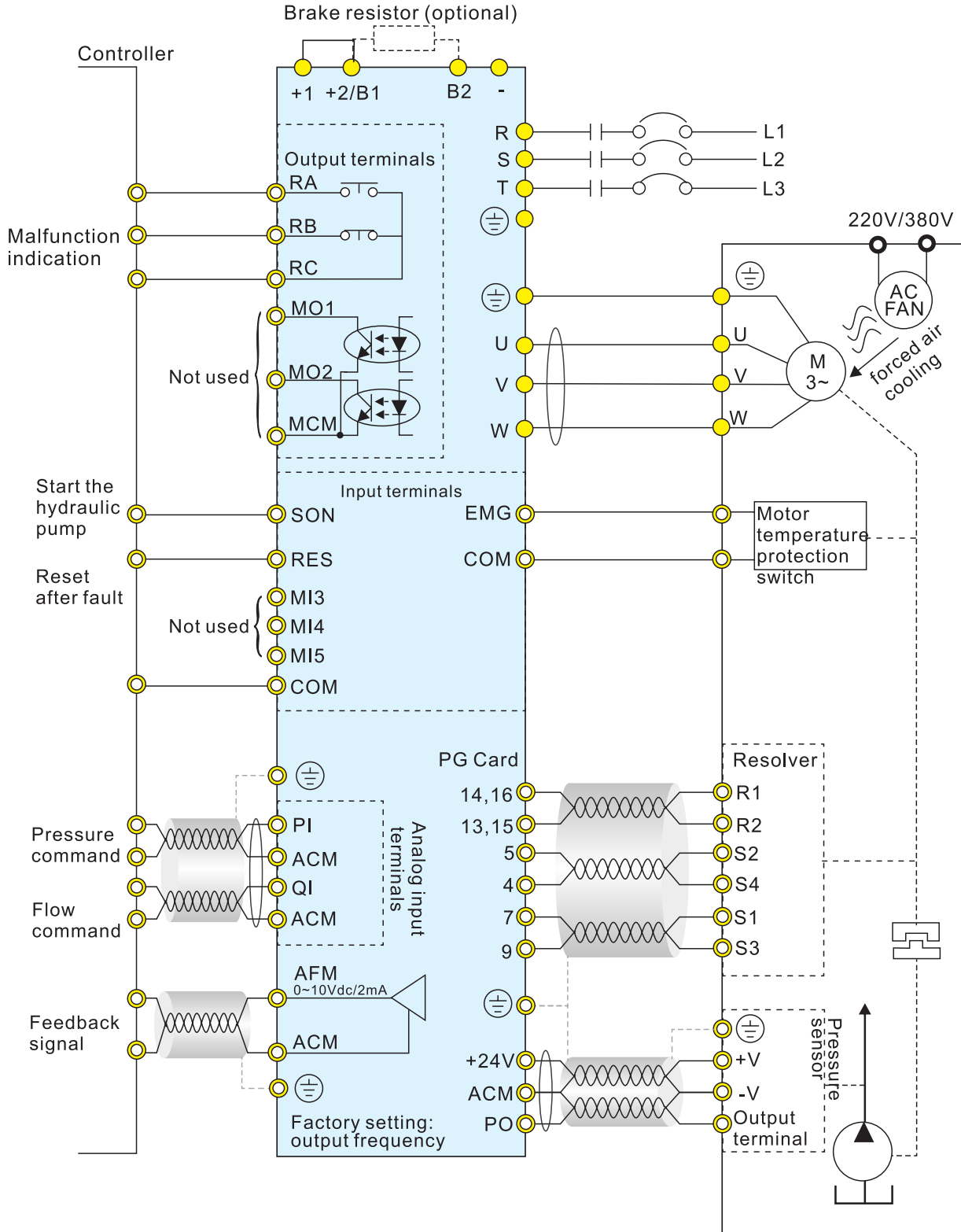


460V	Frame	C					D		E0	E3	E2	
	Model Number VFD-___VL43_-J	055A	075A	110A	150B	185B	220A	300B	370B	450B	550A	750A
	Power (kW)	5.5	7.5	11	15	18.5	22	30	37	45	55	75
	Horsepower (HP)	7.5	10	15	20	25	30	40	50	60	75	100
Output	Max. Current (A) (continuous 60 seconds)	21	27	36	46	58	62	102	124	155	187	255
	Max. Current (A) (continuous 20 seconds)	25	32	42	54	68	78	120	146	182	220	300
Power	Input Current (A)	14	18	24	31	39	47	56	67	87	101	122
	Input Voltage Tolerance	3-phase 380~480V, 50/60Hz										
	Mains Voltage Tolerance	±10% (342~528V)										
	Mains Frequency Tolerance	±5% (47~63Hz)										
	Weight (kg)	8	10	10	10	10	13	13	28	36	50	50

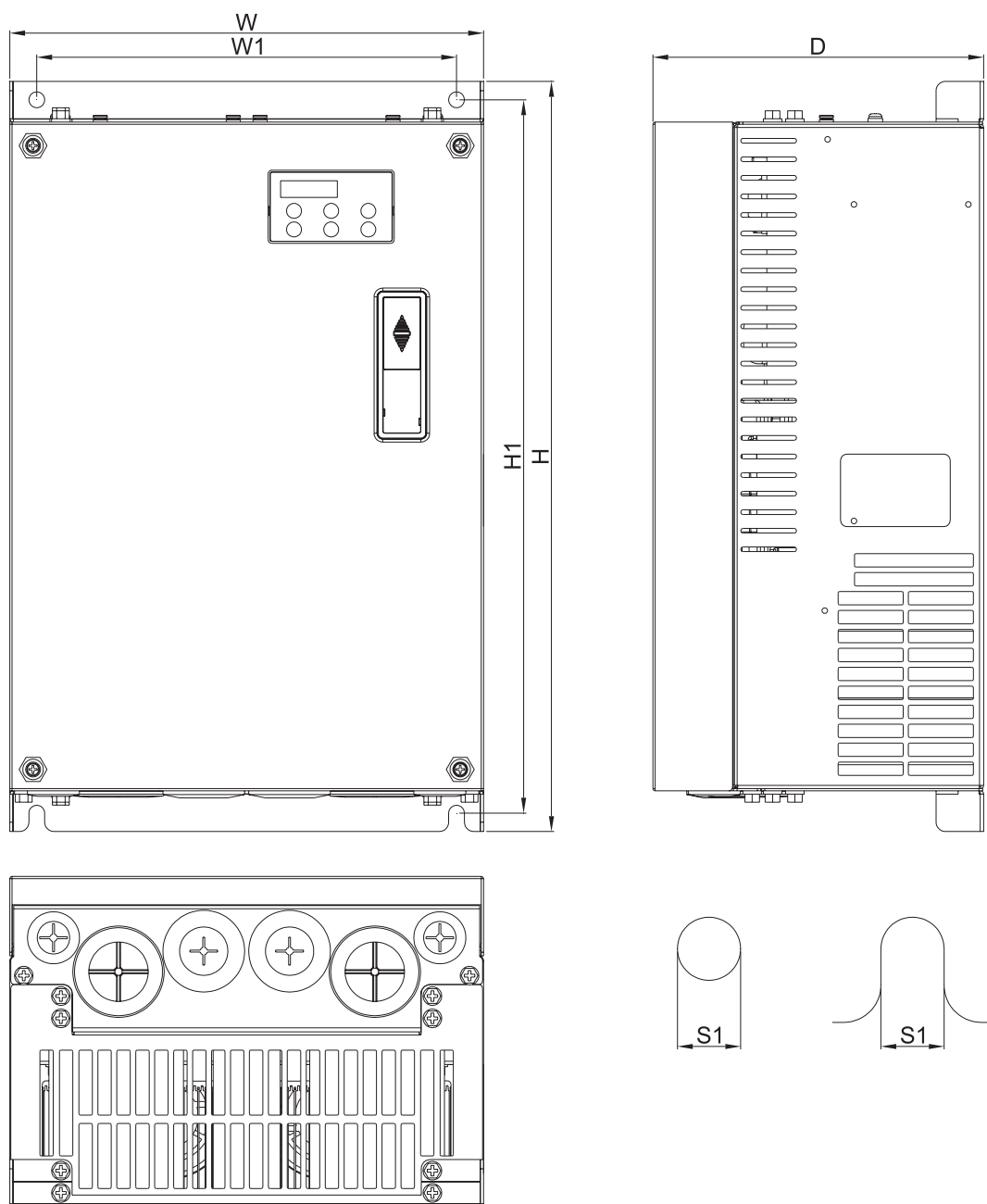
General Specifications	Control Method	SVPWM
	Speed Detector	Resolver
	Speed Input Command	DC 0~10V , support 3-point adjustment for analog inputs
	Pressure Input Command	DC 0~10V , support 3-point adjustment for analog inputs
	Pressure Feedback Command	DC 0~10V
	General Input Signal	5 ch DC24V 8mA
	General Output Signal	2 ch DC24V 50mA, 1 ch Relay output
Optional Accessories	Analog Output Voltage	1 ch dc 0~10V
	Speed Feedback PG Card	Necessary (EMVJ-PG01R)
	Brake Resistor	Necessary (refer to appendix A)
	Pressure Sensor	Necessary, only pressure sensors with output signal 0-10V can be used (max. pressure value can be set by Pr.00-08)
Protections	EMI Filter	Optional (refer to Appendix A)
	Motor Protection	Electronic thermal relay protection
	Over-current	300% of rated current
	Ground leakage current	Higher than 50% rated current
	Overload Ability	150% 60 seconds ; 200% 3 seconds
	Voltage Protection	Over-voltage Level: Vdc>400/800 V; Low-voltage Level: Vdc<200/400 V
	Mains Input Over-Voltage	Varistor (MOV)
Environment	Over-temperature	Built-in Temperature Sensor
	Protection Level	NEMA 1/IP20
	Operation Temperature	-10℃~45℃
	Storage Temperature	-20℃~60℃
	Humidity	90% RH (non-condensing)
	Vibration	1.0G 20Hz, 20~60 Hz 0.6G <20Hz: 1.0G, 20 to 60Hz: 0.6G
	Cooling System	(RUN , STOP) Force cooling (RUN, STOP)
Installation Location		Altitude 1,000m or lower (keep away from corrosive gasses, liquid and dust)
Certifications		CE

NOTE: Built-in brake chopper for models 22kW and below

Wiring Diagram



Dimensions



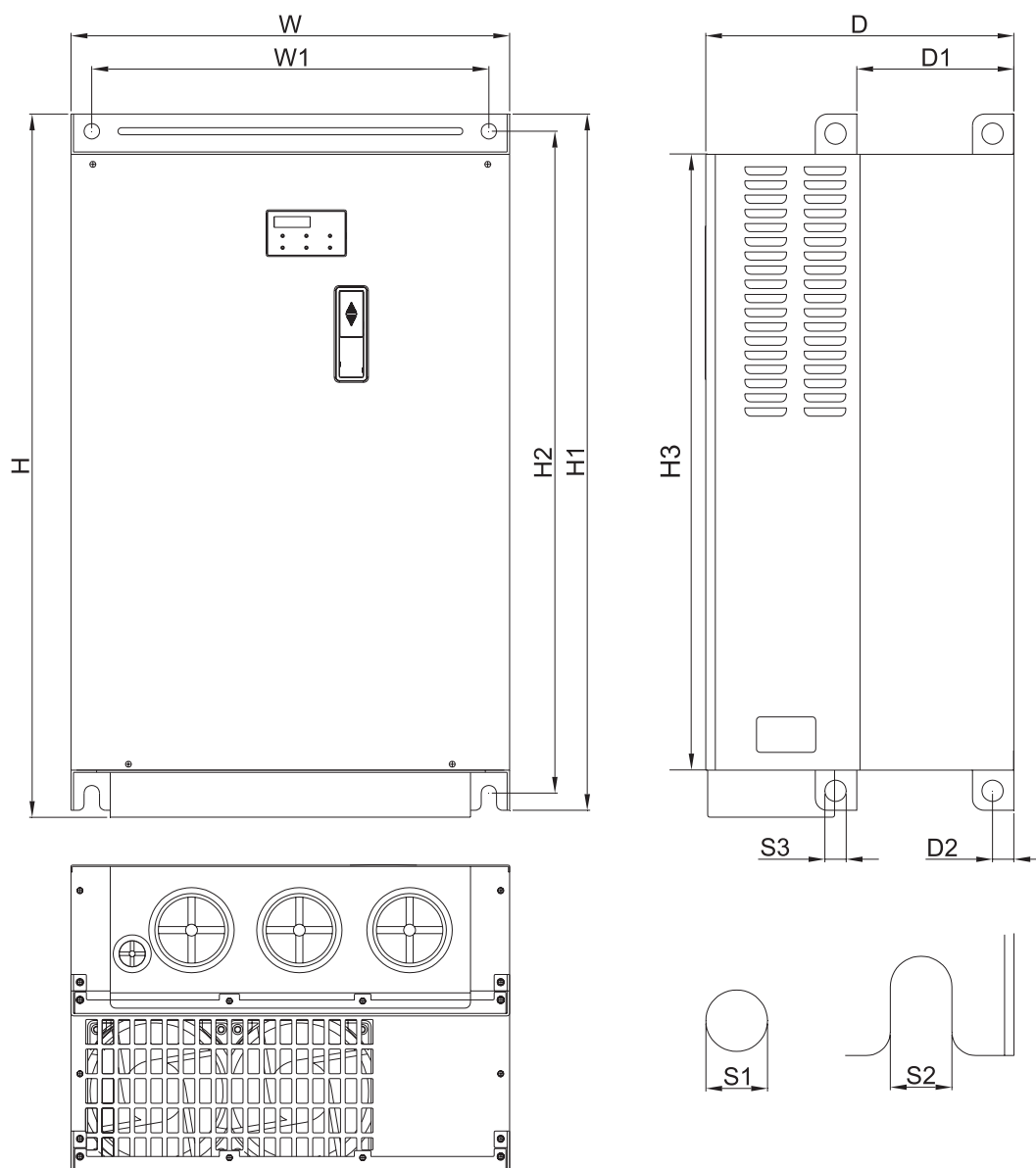
Unit : mm[inch]

Frame	W	W1	H	H1	H2	H3	D	Ø	Ø1	Ø2	Ø3
C	235 [9.25]	204 [8.03]	350 [13.78]	337 [13.27]	320 [12.60]	-	136 [5.35]	6.5 [0.26]	-	34 [1.34]	22 [0.87]
D	255.0 [10.04]	226.0 [8.90]	403.8 [15.90]	384.0 [15.12]	360.0 [14.17]	21.9 [0.86]	168.0 [6.61]	8.5 [0.33]	44 [1.73]	34 [1.34]	22 [0.87]

NOTE

Frame **C**: VFD110VL43A-J, VFD185VL43B-JFrame **D**: VFD220VL43A-J, VFD300VL43B-J

Dimensions



Unit : mm[inch]

Frame	W	W1	H	H1	H2	H3	D	D1	D2	S1	S2	S3	Φ1	Φ2	Φ3
E0	280.0 [11.02]	235.0 [9.25]	516.0 [20.31]	500.0 [19.69]	475.0 [18.70]	442.0 [17.40]	251.7 [9.91]	94.2 [3.71]	16.0 [0.63]	11.0 [0.43]	11.0 [0.43]	18.0 [0.71]	62.7 [2.47]	34.0 [1.34]	22.0 [0.87]
E2	370.0 [14.57]	335.0 [13.19]	595.0 [23.43]	589.0 [23.19]	560.0 [22.05]	-	260.0 [10.24]	132.5 [5.22]	18.0 [0.71]	13.0 [0.51]	13.0 [0.51]	18.0 [0.71]	-	-	-
E3	300.0 [12.99]	285.0 [11.22]	589.0 [23.19]	550.0 [21.65]	525.0 [20.67]	492.0 [19.37]	271.6 [10.69]	107.2 [4.22]	10.6 [0.63]	11.0 [0.43]	11.0 [0.43]	18.0 [0.71]	76.2 [3.00]	34.0 [1.34]	22.0 [0.87]

NOTE

Frame E0: VFD370VL43B-J

Frame E2: VFD550VL43A-J, VFD750VL43A-J

How to Select the Right Hybrid Energy System

(1) Motor Power Selection

• Required torque (Nm) $T = \frac{q \cdot \Delta P}{2\pi \cdot \eta_m}$
 • Output power (kW) $P = \frac{2\pi \cdot T \cdot n}{60,000} = \frac{T \cdot n}{9,550} = \frac{Q \cdot \Delta P}{60 \cdot \eta_t}$

q: cc/rev Displacement(cm ³)	n: Rotation speed	ΔP : Valid pressure difference (Mpa)
Q: Required flow L/min	η_m : Pump mechanical efficiency	η_t : Pump total efficiency

(2) Solution for Signal Interferences

When the drive is installed at the control panel, protections for the signal interference are:

- The wirings of main circuit and control circuit must be separate.
- Proper grounding when necessary
- Use shielding cable for the control circuit
- Use shielded wire for the main circuit wiring

(3) How to Choose a Suitable Hybrid Servo Drive and Motor

In actual applications, the selection of hybrid servo drive and motor will be different due to different oil systems. In the following examples a flow rate of 64L/min and a max. holding pressure of 17.5MPa are used.

- **Displacement of Hydraulic Pumps** : get the displacement of hydraulic pump (cc/rev) from max. System flow (L/min)
Example: Assume that max. system flow is 64L/min. and max. motor speed is 2000rpm. The displacement of hydraulic pump will be $64/2000 \times 1000 = 32\text{cc/rev}$
- **Max. motor torque** : get the max. torque from max. pressure and the displacement of hydraulic pump
Example: Assume that the max. pressure is 17.5MPa and the displacement of the hydraulic pump is 32cc/rev. The torque will be $17.5 \times 32 \times 1.3 / (2\pi) = 116\text{Nm}$ (the factor 1.3 is for compensation of total system losses and it can be changed to 1.2-1.3 as required)
- **Rated motor torque and rated motor power** : The required torque for the holding pressure at the max. pressure should be double of the rated motor torque or less (use the data provided from the motor plant as the first priority). Because the motor temperature operated under this situation is easily over temperature. Assume that we choose the double of the rated torque, the motor can be 9.1kW* with the rated speed 1500rpm when the rated motor torque is 58N-m.
*Motor Power Formula : $P(W) = T(N-m) \times \omega(rpm \times 2\pi/60)$
- **Max. Motor Current** :
If getting the coefficient kt(Torque/A)=3.31 in the motor specification, max. current is about $116/3.31 = 35\text{A}$ when the max. Torque is 116N-m.
- **Select the Right Drive** : Please choose the right drive by the customers' requirement. Assume that the ability of drive's overload is 150% for 60 seconds and 200% for 3 seconds. When the holding pressure is at max. pressure 17.5MPa with 32cc/rev hydraulic pump, the motor current it requires is 35A.



NOTE

If there is no suitable motor, please use the next higher power motor.
Please contact Delta if you have any questions about hybrid servo drive or the integration with your current system.

Servo Motor Parameter Table

Size	Nominal torque	Locked -rotor torque	Base Speed	Maximum Speed	Nominal Current	Locked -rotor current	Nominal Power	Torque constat	Nominal Frequency	Winding Resistance	Winding Inductance	Nominal Valtage	Inertia with brake Opeion
	Nm	Nm	Rpm	Rpm	Arms	Arms	KW	Nm/Arms	Hz	Ohm	mH	V	Kgm ² 10 ⁻³
U1004F.15.3	38	39	1500	1950	11.6	12	6	3.32	100	1.67	16.33	350	6
U1004F.17.3	38.9	40.4	1700	2150	15.2	15.8	7.6	2.81	113.4	1.19	16	381	6
U1004F.20.3	42	44	2000	2450	18.8	19.6	8.7	2.37	133.4	0.85	8.33	321	6
U1005F.15.3	55	60.7	1500	1950	16.6	20.2	8.6	3.31	100	0.97	14.6	300	6.1
U1005F.17.3	57	59.5	1700	2150	20.4	23.3	10	2.81	113.4	0.72	10.6	336	6.1
U1005F.20.3	58	60.7	2000	2450	24.3	25.7	12	2.6	133.4	0.6	9	364	6.1
U1007F.15.3	74	81.6	1500	1950	23.9	26.5	11.6	3.37	100	0.665	11.4	329	9
U1007F.17.3	80	83	1700	2150	28.2	31.8	14	2.85	113.4	0.48	8.09	341	9
U1007F.20.3	87	92	2000	2450	36.7	38.3	18.2	2.53	133.4	0.356	4.74	341	9
U1008F.15.3	103	106.1	1500	1950	33.2	34.6	16.4	3.38	100	0.473	9.05	370	9.8
U1008F.17.3	96.2	99.6	1700	2150	35.1	36.8	17.6	2.98	113.4	0.417	7.04	370	9.8
U1008F.20.3	95.6	99.6	2000	2450	40.1	42.5	20.4	2.58	133.4	0.314	5.29	370	9.8
U1010F.15.3	128	130.2	1500	1950	41	42.9	20	3.3	100	0.338	7.38	360	12
U1010F.18.3	122	126.6	1800	2250	44	48.7	23	2.87	120	0.273	5.42	312	12
U1010F.20.3	135	139	2000	2450	60.5	61.8	28.3	2.37	133.4	0.181	2.78	321	12
U1013F.15.3	186	190	1500	1950	61	63.8	29	3.26	100	0.249	3.7	370	15
U1013F.17.3	164.1	169.5	1700	2150	55.4	58.5	28.7	3.19	113.4	0.236	5.03	380	15
U1013F.20.3	175	185	2000	2450	73.7	77.3	36.7	2.53	133.4	0.144	2.37	340	15
U1015F.15.3	220	225	1500	2000	72.73	80.93	37	3.096	100	0.180	4.029	370	19
U1015F.20.3	215	223	2000	2500	96	106.8	49	2.322	133.4	0.103	2.266	371	19
U1315F.15.3	196	198	1500	2000	71.48	72.51	31	3.015	100	0.169	6.458	378	27
U1315F.20.3	191	196	2000	2500	97.76	100.2	43	2.154	133	0.089	3.295	380	27
U1320F.15.3	210	210	1500	1950	62	62	33	3.43	100	0.098	4.46	369	36
U1320F.17.3	229	236	1700	2150	92.6	98.3	39.4	2.94	113.4	0.107	4.5	377	36
U1320F.18.3	232	240	1800	2250	96.46	99.8	44	2.64	120	0.085	3.647	379	36
U1320F.20.3	269	286	2000	2450	120.7	127.8	56.3	2.37	133.4	0.068	2.13	347	36
U1330F.15.3	380	416	1500	1950	106	117	60	3.56	100	0.082	3.19	280	49
U1330F.17.3	349	363	1700	2150	145	153.4	62	2.89	113	0.060	2.9	268	49
U1330F.20.3	389	417	2000	2450	155	166	81	2.67	133	0.046	1.8	286	49

Note: 1. Max speed: If you don't use the flax-weakening control function, the max rotatig speed will be higwer 500rpm than rated speed. If you use the flax-weakening control function, the max rotatig speed depends on the driue.

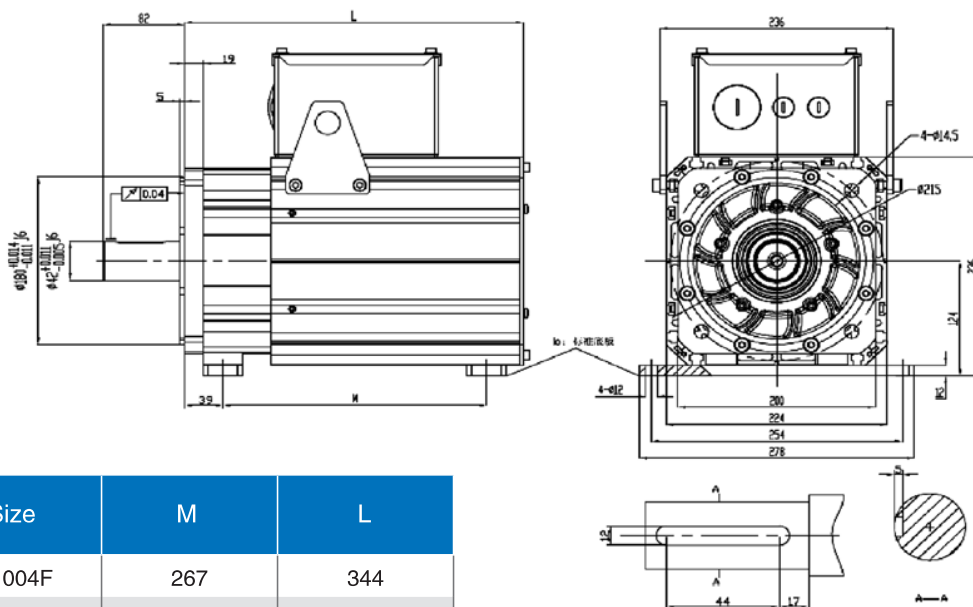
2. Pole Number: The pole number is 8 rooles frabove, it's 4 pairs of rodes.

Drive installation Size:

The motor's spindle wses the standard shaft coptic axis or with single bond axis. Internal splined shaft outer splined shaft or hollow shaft. The signal of encoder inside of motor's junction box uses PCB board, also can choose aerial socket. The motor instally can choose flange or baseplate.

Outline Drawing and Installation size for standard shaft motor

U10F Series drawing for standard shaft motor



Size	M	L
U1004F	267	344
U1005F	285	379
U1007F	312	416
U1008F	354	457
U1010F	396	488
U1013F	471	559

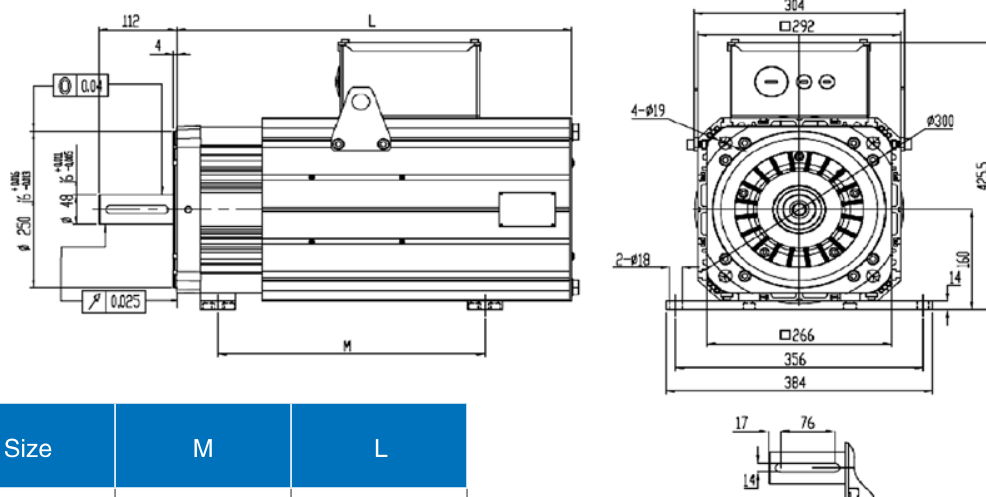
Description for select item

K: With keyway, standard key (A tyroe 12x8x56)

b: With standard baseplate

Note: Accessory items 1. Signal aerial soclctet 2. Stardard baseplate

U13F Series drawing for standard shaft motor



Size	M	L
U1320F	370	577
U1330F	476	684
U1340F	583	791

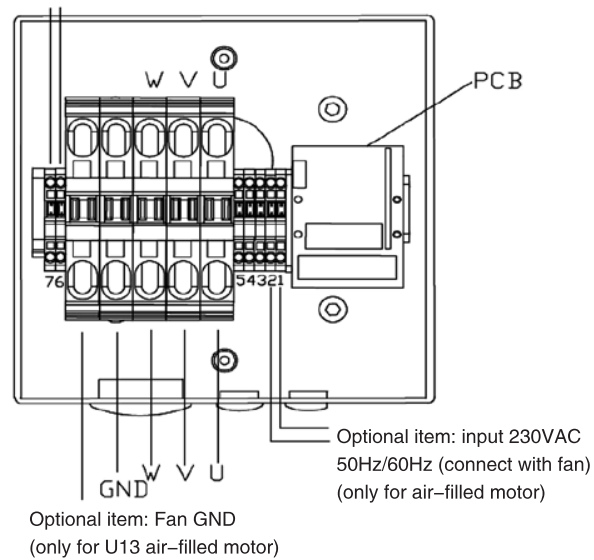
Note: 1. Optional standard key: A type 14x9x90;

2. Adjusting the size of junction box according to the motor current flow.

Note: Accessory items 1. Signal aerial soclctet 2. Stardard baseplate

Specification for the junction of injection woldiy machine used professional

Specification for the junction of power

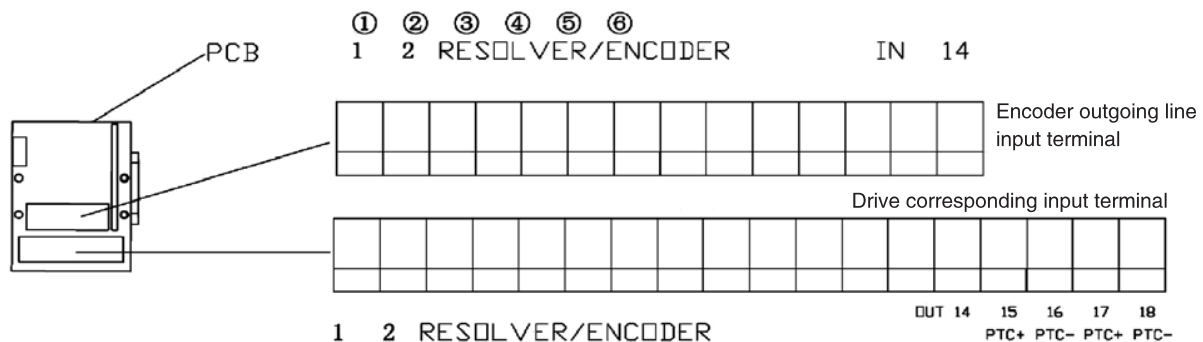


Specification

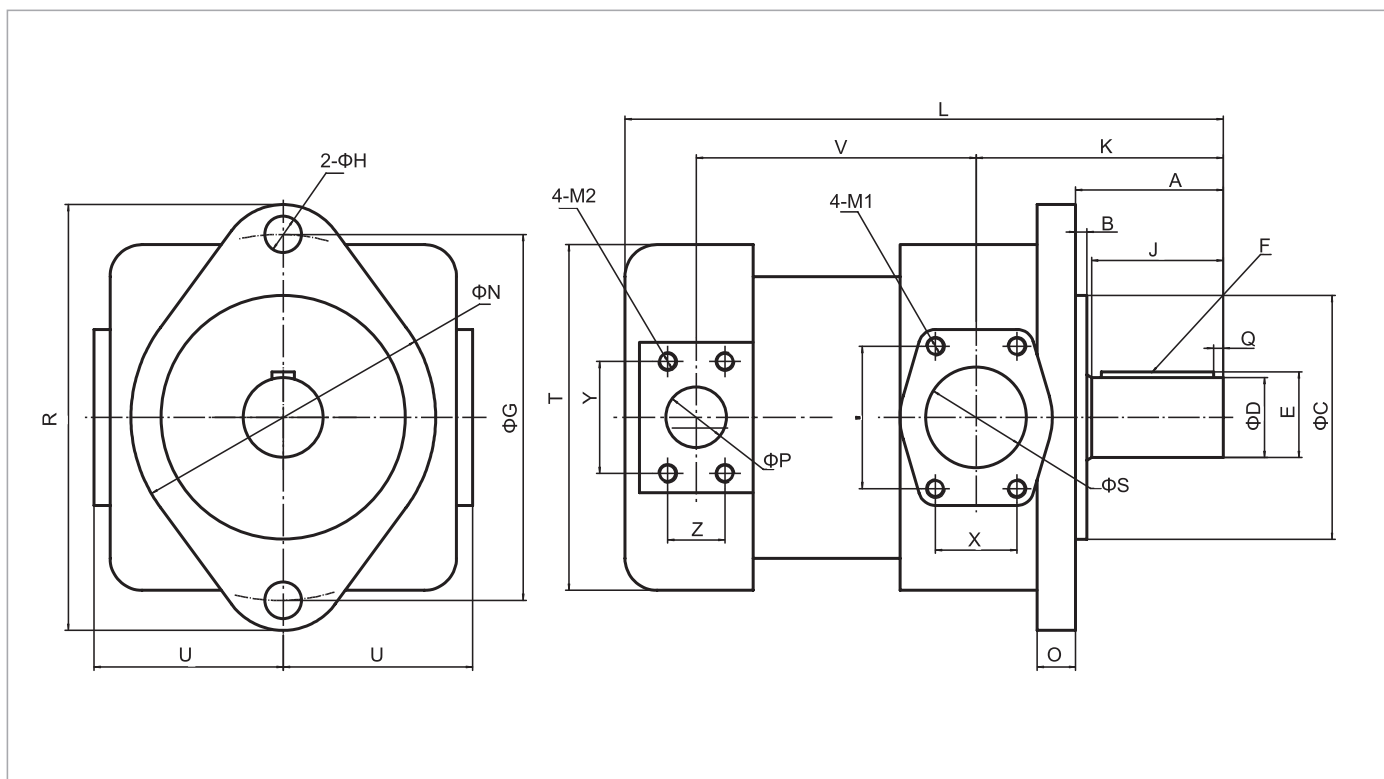
- (1) Servo driver output of U,V and W phase and ground, respectively, received the motor input U,V,W and ground wire;
 - (2) U10F Ventilazione forzata: Fan power 51W/53W, Current 0.29/0.33A, Voltage 220Vac
 - (3) U13F Ventilazione forzata: Fan power 135W / 200W, Current 0.6 / 0.88A, Voltage 220Vac
 - (4) When using 85°C temperature controlled switch, internal motor enamelled wire winding reaches $85 \pm 5^\circ\text{C}$, the temperature controlled switch will be closed, the fan will work.
 - (5) When not using the temperature controlled switch the fan as above will work.
- Remark: Power and fan terminals is kind prevail, this picture is for reference only.

Specification for signal junction

The encoder for the servo motor of injection molding machine used professionally using rotating transformer, the model number of commonly rotating transformer is TS2640N321E64. Also a few of factories use the servo motor of incremental encoder. The follow definition and description is for PCB board, ariation socket connection and signal of encoder.



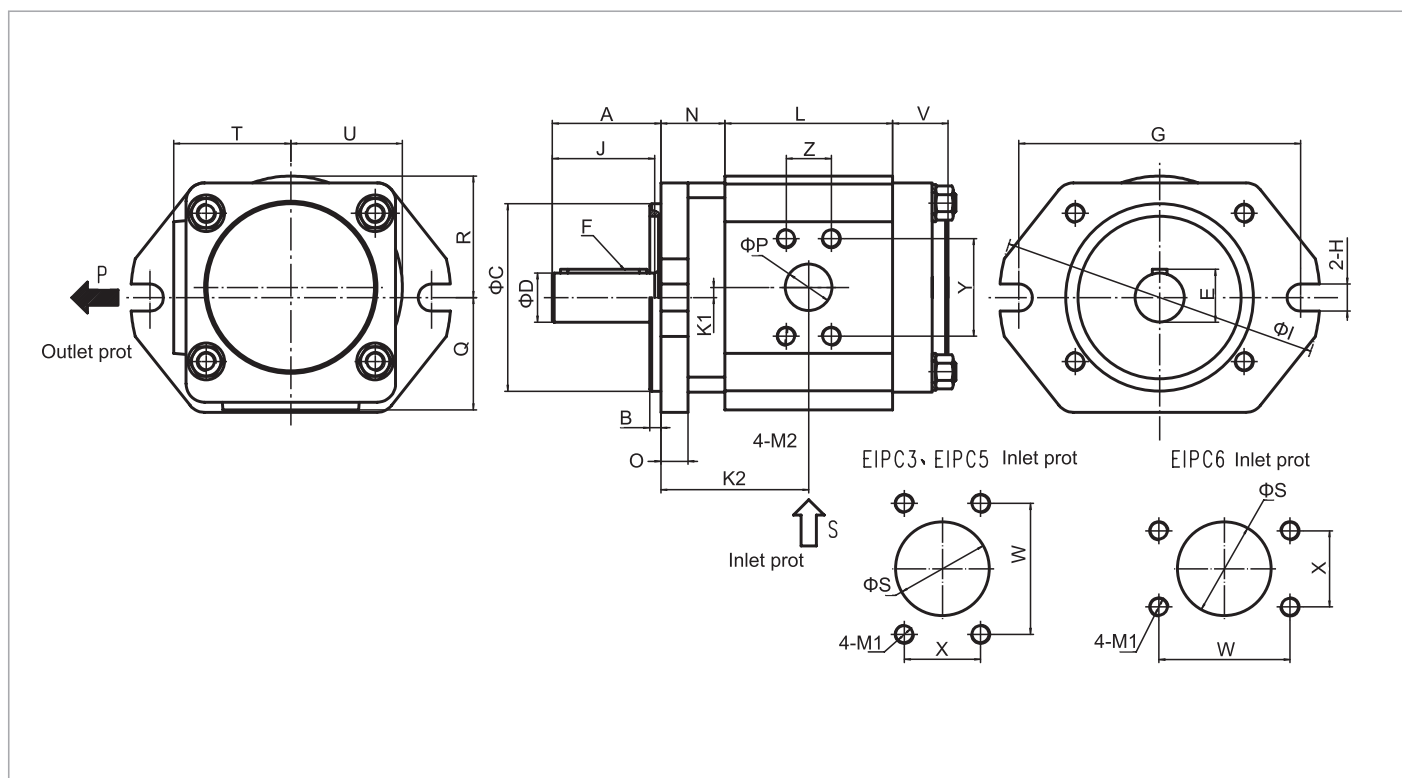
Sumitomo internal gear pump installation dimensions



Model	A	B	ΦC	ΦD	E	key width x length	Q	2-ΦH	ΦG	J	K	V
QT42-31.5	68	7	Φ101.6 ⁰ _{-0.05}	Φ32 ^{+0.011} _{-0.005}	35	Φ10 ⁰ _{0.036} x50	4	2-Φ14.5	Φ146	58	115	114
QT42-40												
QT52-50	92	7	Φ127 ⁰ _{-0.05}	Φ40 ^{+0.011} _{-0.005}	43	Φ12 ⁰ _{0.043} x70	6	2-Φ18.5	Φ181	82	145	136
QT52-63												
QT62-80	92	7	Φ152.4 ⁰ _{-0.05}	Φ50 ^{+0.011} _{-0.005}	53.5	Φ14 ⁰ _{0.043} x70	6	2-Φ23	Φ228.6	82	154	174.5
QT62-100												
QT62-125												

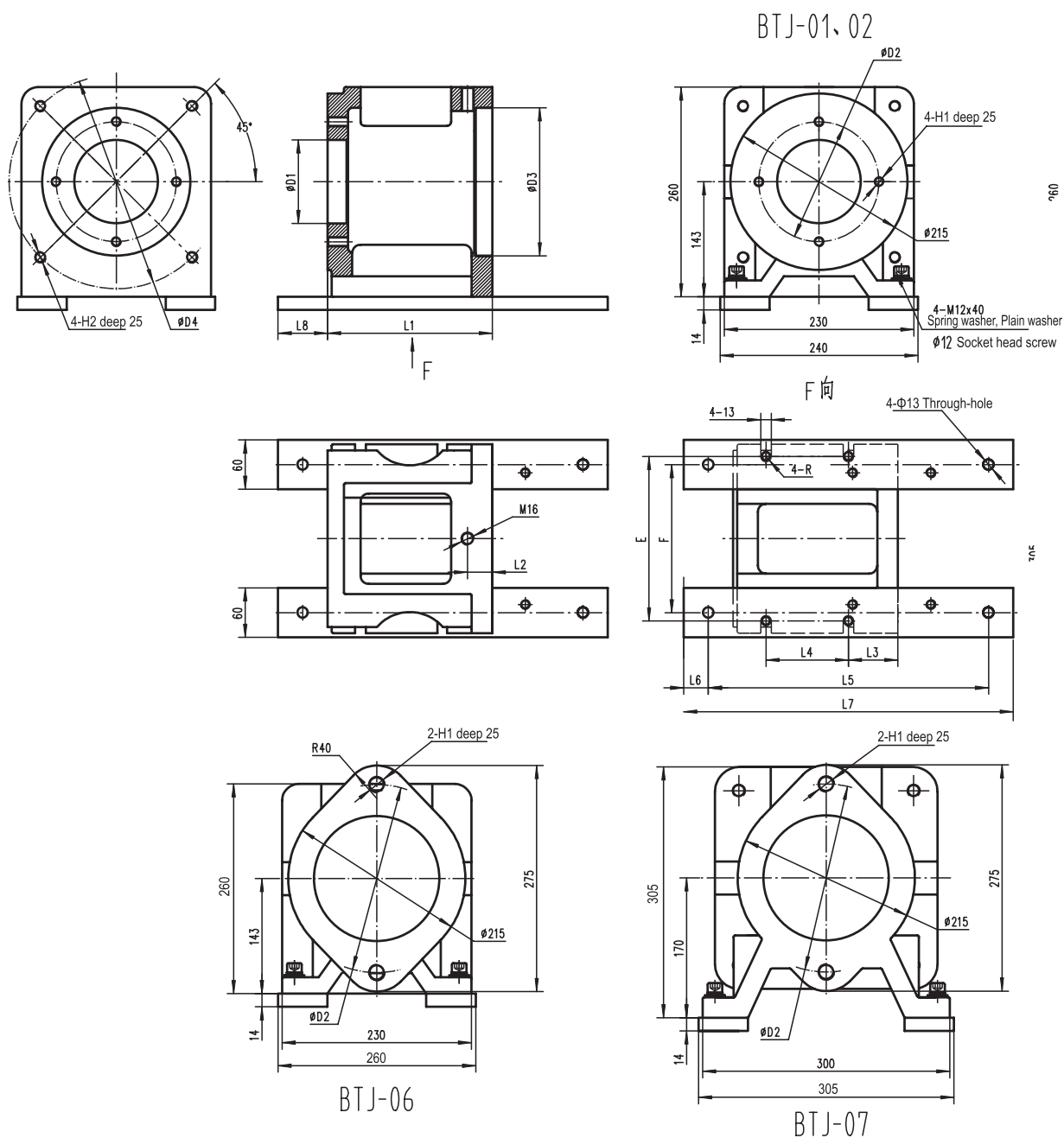
Model	L	ΦN	O	R	T	U	ΦS	W	X	M1	ΦP	Y	Z	M2
QT42-31.5	256	Φ125	16	172	139	75	Φ38	69.9	35.7	M12 deep 25	Φ25	52.4	26.2	M10 deep 20
QT42-40														
QT52-50	313	Φ150	20	214	170	93	Φ50	77.8	42.9	M12 deep 25	Φ32	58.7	30.2	M10 deep 20
QT52-63														
QT62-80	373	Φ190	24	266	216	118	Φ63	88.9	50.8	M12 deep 25	Φ38	69.9	35.7	M12 deep 25
QT62-100														
QT62-125														

Eckerle Internal gear pump installation dimensions



Model	A	B	ΦC	ΦD	E	F key width x length	O	2-H	G	ΦI	J	K1	K2	V
EIPC3-32	56	6	Φ 101.6h8	Φ 25g6	28	8h9x36	13	2-13.5	146	Φ 170	48	6.5	83.2	34
EIPC3-40													88.7	
EIPC3-50													95.7	
EIPC3-64													95.7	76
EIPC5-80	68	6	Φ 127h8	Φ 32g7	35	10h9x60	25	2-17.5	181	Φ 208	70	8.3	92.5	41.5
EIPC5-100													100.5	
EIPC6-125	88	9	Φ 152.4h8	Φ 40g6	43	12h9x70	22	2-22	228.6	Φ 260	83	8.3	109.5	45
EIPC6-160													120	

Model	L	N	Q	R	T	U	ΦS	W	X	M1	ΦP	Y	Z	M2
EIPC3-32	114.4	26	57	67.5	64	65	Φ 32	58.7	30.2	M10 deep 17	Φ 18	47.6	22.2	M10 deep 17
EIPC3-40	125.4										Φ 20	52.4	26.2	M10 deep 17
EIPC3-50	139.4													
EIPC3-64	139.4													
EIPC5-80	93	46	75	82	75.5	76	Φ 47.2	77.8	42.9	M12 deep 20	Φ 31.75	66.7	31.8	M14 deep 24
EIPC5-100	109						Φ 63.5	88.9	50.8	M12 deep 20				
EIPC6-125	115	52	91.2	98.8	95	90	Φ 63.5	88.9	50.8	M12 deep 20	Φ 38.1	79.4	36.5	M16深24
EIPC6-160	136						Φ 76.2	106.4	61.9	M16 deep 22				



Model	ΦD1	ΦD2	ΦD3	ΦD4	H1	H2	L1	L2	L3	L4	E	F	L5	L6	L7	L8
BTJ-01	Φ 101.6 ^{+0.025} _{-0.010}	Φ 146	Φ 180 ^{+0.039} ₀	Φ 215	M12	M12	170	15	45	95	200	180	340	30	400	70
BTJ-02	Φ 127 ^{+0.025} _{-0.010}	Φ 181	Φ 180 ^{+0.039} ₀	Φ 215	M16	M12	200	15	60	100	200	180	340	30	400	55
BTJ-06	Φ 152.4 ^{+0.025} _{-0.010}	Φ 228.6	Φ 180 ^{+0.039} ₀	Φ 215	M20	M12	220	15	65	100	200	180	420	40	500	85
BTJ-07	Φ 152.4 ^{+0.025} _{-0.010}	Φ 228.6	Φ 250 ^{+0.039} ₀	Φ 300	M20	M16	230	30	60	140	270	250	420	40	500	75

High-performance Water-based vane pump

Overview

The CPV pump is one high performance water based vane pump . developed and produced by our company . It is with simple and reasonable structure , high pressure , pressure pulse small , high efficiency , long working life , competitive price, and it is a energy saving and environmental Product . It has won the China state patent . It can be used with high water based hydraulic fluid , (it is composed of 5% non-oil high water based hydraulic fluid and 95% water) . The most strength and advantage is no pollution , energy saving and environmental , cheap price , flame-retardant , antirust , better than all others flame-retardant fluid . such as water glycol etc . In addition to high temperature and fire situation . it also can be used in kinds of hydraulic machines and system which mainly use hydraulic oil as working fluid , especially it is suitable in energy saving situation . So with higher pressure and more steady performance , the CPV pump must instead the traditional pumps which use hydraulic oil as working fluid and polluted environment too much step by step in the future . to reach the goal really achieve energy saving and environmental . Energy saving and environmental can not be only a word , it must be done from me , from now on . We can predict for sure : from now on , the CPV pump will have widely using and market .

- ◆CPVZ series : 5.8 to 76ml/rev
- ◆CPV3 series : 48 to 158ml/rev
- ◆CPV4 series : 132 to 227ml/rev

The Characteristics of CPV Pump

- ◆High working pressure :
The nominal pressure is 20 MPa , maximum pressure can reach 25 MPa .
- ◆Displacement pulse small :
The pump is running steadily at the pressure 20 MPa, the pressure pulse value is 0.01-0.03MPa , the pressure and displacement pulse value is obviously lower than hydraulic oil vane pump .
- ◆High volume efficiency :
Though viscosity of water based fluid is 1/30 of No . 46 anti-wear , but the volume efficiency still can reach the hydraulic pump standard .
High stain-resistant :
Liquid does not need be filtered accurately , does not need change other components on the hydraulic system .
- ◆Long working life :
After the pump working life test , it has been beyond the state standard of hydraulic oil pressure pump working life .
- ◆Competitive price :
CPV pump price is more lower than the same displacement of water based piston pump, but more steady , and with more lower noise level .
- ◆Lower using cost :
The cost of non-oil water based hydraulic fluid is 1/10 of hydraulic oil, 1/40 of water glycol , 1/70 of phosphate ester .
- ◆Energy saving and environmental :
Use the specified HR-SY-1 non-oil hydraulic fluid .
- ◆Assembly Type Pump Core Structure.
CPV series vane pumps use the whole built-in pump core structure and their cores can be replaced or renewed conveniently within a few minutes with low cost and small pollution risk .
- ◆Recommended Operating Liquid :
High water-based synthetic hydraulic fluid HR-SY-1 , when the antiwear hydraulic oil is used , oil viscosity is better equal to or less than 15Cst.
- ◆Working Fluid Temperature .
5-55°C for high water-based fluid .
- ◆Attentions of High Water-Based Fluid Tank .
The tank for high water-based hydraulic fluid must be higher than suction inlet of the pump in order to ensure the pump to inhale the liquid
under positive pressure : PH value of used liquid is 9-10 . No hydraulic oil shall be mixed into the liquid .

General Use Instructions

- Check the pump steering , speed , pressure , temperature and liquid mass and viscosity ;
- Check whether the Pump suction conditions meet use requirements :
- Check the rotation shaft type and whether the torque meets the requirements of working conditions :
- Choose the appropriate coupler to minimize the radial load (by weight , different axis deviation) :
- The filtration must meet the requirements of the minimum degree of contamination :
- Working environment : avoid the impact of noise , pollution and striking .

Model Designation

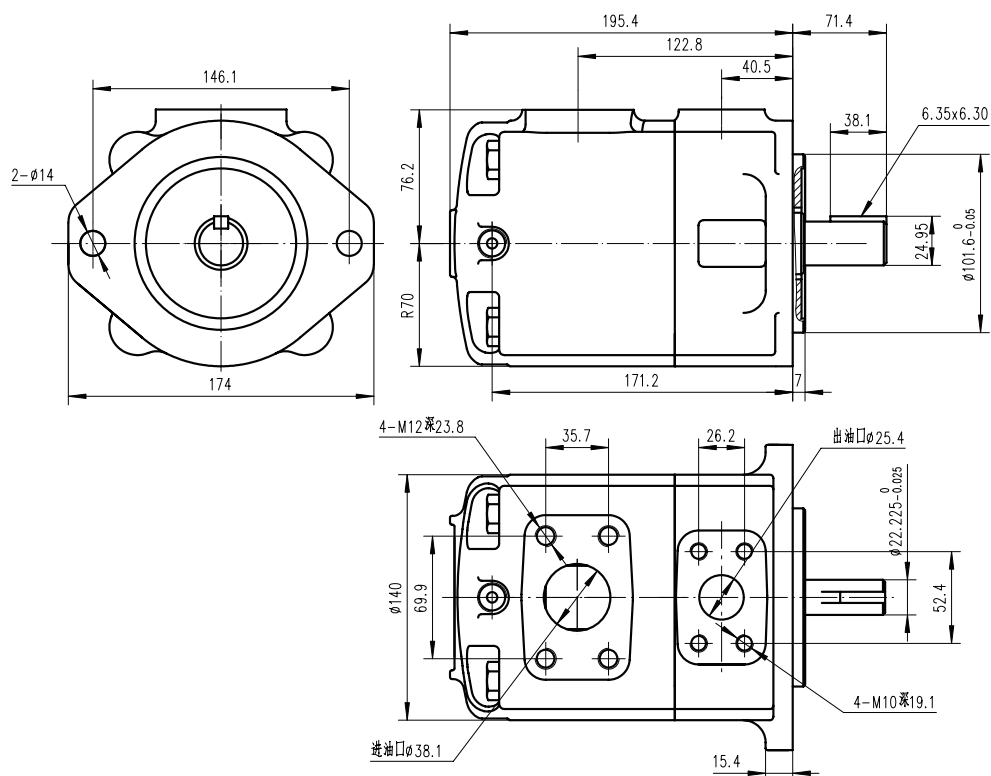
(W.)	CPV2	12	A	-1	A	08	R
Note	Series	Flow code	Port connection	Shaft type	Outlet Positions	Design number	Rotation
No-marking: Petroleum series oil	CPV2	05、06、08、 10、12、14、 17、20、22、 25	A-SAE 4-bolt flange	-1 Keyed shaft	(Views from shaft end of pump) A-Opposite inlet port B-90° CCW from inlet C-Inline with inlet D-90° CW from inlet	08	(Views from shaft end of pump) R-right hand for clockwise L-left hand for counter-clockwise

Using the specified without oil hydraulic fluid HR-SY-1 technical parameters

Technical Data

Series	Flow code (US gpm)	Geometric displacement L/r(in ³ /r)	Speed 1000r/min	Speed 1500r/min	Speed 1200r/min	Speed 1800r/min
			Max.pressure Mpa	Max.pressure Mpa	Max.pressure Mpa	Max.pressure Mpa
CPV2	05	16	14	16	16	18
	06	21	14	16	16	18
	08	26	16	18	16	18
	10	34	16	18	16	18
	12	37	16	18	16	18
	14	44	16	18	16	18
	17	53	14	16	16	16
	20	63	14	16	16	16
	22	70.6	14	16	16	16
	25	76	14	16	16	16

Installation Dimension



Weight: 15.7kg

Unit Conversion

Name	Metric		Imperial	
Pressure,p	Mpa bar	10bar 145.0psi 0.1MPa 14.50psi	psi(lbs/in ²)	0.006895 Mpa 0.06895 bar
Delivery volume,q	ml/rev	0.06102in ³ /rev	In ³ /rev	16.387ml/rev
Flow,Q	L/min(Lpm)	0.2642 gpm	gpm	3.78L/min
Power,N	kW	1.341 hp	hp	0.7457 kW
Torque,T	Nm	0.7376 lb-in	lb-in	1.3567 Nm
Weight,W	kg	2.205 lbs	lb	0.4536 kg
Force,F	N	4.448 lbs	lb	0.2248 N
Length,L	m mm	3.281ft 0.03937in	ft In	0.309m 25.4mm
Area,A	cm ²	0.1550in ²	In ²	6.452cm ²
Volume,V	cm ³ (ml)	0.06102in ³	In ³	16.387cm ³
Temperature,t	°C	$= \frac{^{\circ}\text{F}-32}{1.8}$	°F	$=1.8^{\circ}\text{C}+32$
Viscosity,V	mm ² /s(cSt)	Dynamic viscosity table (\cong) $\frac{\text{SUS}-14}{4.25}$	SUS	Dynamic viscosity table (\cong cStx4.25=14)

Common formula of fluid drive

Computing projects	Metric	Imperial
Pump input torque , T_{Pin}	$T_{Pin} = \frac{pq}{20\pi\eta_m}$ (Nm)	$T_{Pin} = \frac{pq}{2\pi\eta_m}$ (lb-in)
Pump input torque , N_{Pin}	$N_{Pin} = \frac{pq\eta}{600000\eta} = \frac{pQ}{600\eta}$ (kW)	$N_{Pin} = \frac{pq\eta}{395934\eta} = \frac{pQ}{1714\eta}$ (hp)
Pump output Flow , Q_{pout}	$Q_{pout} = \frac{Nq\eta_v}{1000}$ (L/min)	$Q_{pout} = \frac{nq\eta_v}{231}$ (Usgpm)
Hydraulic Motor Speed , n_M	$n_M = \frac{1000Q\eta_v}{q_M}$ (rpm)	$n_M = \frac{231Q\eta_v}{q_M}$ (rpm)
Hydraulic Motor output torque , T_{Mout}	$T_{Mout} = \frac{pq\eta_m}{20\pi}$ (Nm)	$T_{Mout} = \frac{pq\eta_m}{2\pi}$ (lb-in)
Hydraulic Motor output power , N_{Mout}	$N_{Mout} = \frac{Npq\eta}{600000\eta} = \frac{pQ\eta}{600}$ (kW)	$N_{Mout} = \frac{npq\eta}{395934\eta} = \frac{pQ\eta}{1714}$ (hp)

Notes: η_m -mechanical efficiency η_v -volumetric efficiency η -total efficiency

We will continue to improve and update products so manufacturers change the technical parameters to retain the right time, without prior notice, Therefore, manufacturer will reserve the right to change technical parameters in time with out prior notice.

Vane Pump Installation, Application and Maintenance

◇ Operating oil

Anti-wear hydraulic oil is recommended for better performance and longer life. Viscosity range: 17–68cst(2.5–5°E).

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Filtration: the filtration rating should not be lower than 25 μm. Filter of 70–150 μm on the inlet port is recommended and its delivery should not be lower than 200% that of pump.

Operating temperature: 10–60°C.

◇ Installation

Foot and frame for pump must be reliable, solid and good in vibration absorbence.

Horizontal mounting is recommended to maintain necessary case fluid level, concentricity of shafts between pump and motor is important to pump life and should be within $\Phi 0.1$ mm. It is better to use flexible coupling to avoid harmful effects.

The oil pump allows the inhalation vacuum as 110 mm column of mercury. Installation should near fuel tank, inhaling the height can not be big in 500 mms.

To reduce noise and vibration of system caused by trapped air, attachment flange at inlet port, all fittings and pipelines must be strictly sealed.

The diameter of absorb pipeline should not smaller than that of inlet.

There should be a plank in the tank to separate bubble and dirty thing from used oil. Return pipeline under oil is recommended (not connect with inlet) for avoid bubble.

◇ Start

Before starting pump, please check up if the inlet and outlet have been correctly connected and the rotation of the pump is inline with the nameplate. (CW without notice).

After confirming it is able to work well without burthen, please start.

When initially starting the pump after long-time unused, removing all trapped air from the system can be accomplished by loosening flange or connections.

◇ Maintenance

Please inject defend rust oil in the pump, paint the surface with defend rust grease and then cover ports, if you do not want to use it right now.

Please check up oil periodically, while if the oil can not meet the demand, replace it and clean up tank.

Purging of filter regular is recommended.

Keep the normal level of oil in the tank. When capability of tubing and tank are large, even if injected enough oil. Because when starting, the level of oil would fall, then please add some oil. Please observe the level of oil and add some oil when needed.

After a period of working, it is likely that the install bolt and flange of inlet and outlet would loose because of vibrating. Please tight them.

The cartridge design vane pumps offers fast and efficient field service ability, when replacing the cartridge, seals inside the pump should be checked to avoid them crimping; when tightening the fastening screws, they should be treated with even force in diagonal direction.

Common trouble and solving

Trouble	Cause of trouble	Remedy method
Pump starveling Or no pressure	1. Not the same of rotation direction of primer as that of pump	Correct rotation direction of primer
	2. Key of pump shaft falls off	Re-assembly the key
	3. Wrong connecting of inlet and outlet	According to operating manual, re-connect them
	4. Oil level in tank too low, suction pipe exposed above the oil level	Fill oil to the position above the lowest oil level in tank
	5. Rotation speed too low, suction not enough	Increase speed of pump above the lowest one
	6. Oil viscosity too high	Use recommended operating oil
	7. Oil viscosity too high due to lower ambient temperature	Heat oil to normal operating temperature range
	8. Vane is clipped due to lower filtration of system oil	Disassembly, mend pump cartridge parts; after finishing the above, carefully reassemble them and change the oil
	9. Pipe line or filter blocked, oil in suction line can't flow freely	Clean pipe line and filter, remove foreign material, change or filter oil in the tank
	10. Filtration rating of the suction filter too high	Select correct filter according to operating manual
	11. Air leak in suction line	Check every connection and re-tighten them
	12. Small delivery pump poor suction	Full fill the pump with oil
Flow not enough, lower than rated one	1. Speed of pump lower than rated value	According to rated speed in operating manual, select correct model of electric motor
	2. There is leakage in system	Check system, repair leakage point
	3. Locking screws for pump cover loosen due to longer time vibration	Properly tighten the screws
	4. There is leakage in suction line	Check all connection and re-seal or lock them
	5. Suction oil not enough	
	① Oil level in tank too low	Fill oil to and above the lowest level
	② Inlet Filter blocked or its size too small	Clean filter or select bigger size filter (with double flow of that of pump)
	③ Suction line blocked or too small in size	Clean pipe line, select bigger size pipe
	④ Oil viscosity too high or too low	Use recommended operating oil
Pressure lower	1. Pump starveling or flow not enough	Same as the above
	2. Adjusting pressure of relief valve too low or trouble in it	Re-adjust relief valve or repair it
	3. There is leakage in system	Check system and repair leakage point
	4. Locking screws for pump cover loosen due to longer time vibration	Properly tighten screws

Trouble	Cause of trouble	Remedy method
Pressure lower	5. Leakage in suction line	Check all connections and seal or tighten them
	6. Suction not enough	Same as the above
Noise too high	1. Leak in suction line	Check all connections in pipe line and reseal or tighten them
	2. Suction not enough	Same as the above
	3. Poor concentricity between shaft of pump and that of electric motor	Re-assemble until attain the precision specified
	4. There are bubbles in oil	Fill more oil or put return port under oil level in tank
	5. Pump speed too high	Select recommended speed range
	6. Pump pressure too high	Decrease pressure below rated value
	7. Air leak in shaft seal	Change the seal
Too much heat	1. Oil temperature too high	Improve heat radiation or install a cooler to control oil temperature within normal range
	2. Oil viscosity too low and internal leakage too much	Select oprating oil with recommended viscosity
	3. Operating pressure too high	Decrease it below rated value
	4. Return pipe directly connected to pump inlet	Connecting return pipe under oil level in tank
Vibration too big	1. Poor concentricity between shafts of pump and motor	Re-assemble until attain the precision specified
	2. Mounting screw loosen	Tighten screws
	3. Speed or pressure too high	Decrease them below rated value
	4. Vane is clipped due to lower filtration of system oil	Disassemble,mend and clean cartridge parts;after finishing the above,carefully reassemble them and change the oil
	5. Air leak in suction line	Check all connections and reseal or tighten them
	6. Suction area not enough	Same as the above
	7. There are bubbles in oil	Fill more oil or put return port under oil level in tank
External leakage	1. Seal aging or damaged	Replace seals
	2. Connection of inlet or outlet loosen	Tighten screws of fittings
	3. Sealing surface cracking	Mend or grind the surface
	4. Sand holes in housing	Replace housing

NOTE

1.Please notice the following factors when booking.

The product use, using environmental pressure(usual pressure,moment highest pressure and cartridge performance) speed and rotation, torque, flow, kinds of prime motive,install positions and ways, kinds of oil.

2. Please note model and specification in detail when booking.

eg: 25V19A-1A22R