Hengli

Content

Feature

Technical Data

Size		28	60	85	115	160	170	200	215	280
Max displacement (cc/rev)		28.1	62	85.2	115.6	160	171.8	200	216.5	280.1
Min displacement (cc/rev)		—								
Direction of rotation		Clockwise, Counter clockwise								
Rotation speed (rpm) (Not at min. displacement)	Rated	5550	4450	3900	3550	3100	3100	2900	2900	2500
	Max.	8750	7200	6800	6150	4900	4900	4600	4800	3550
Rotation speed (rpm) (At min. displacement)	Max.	10450	8400	8350	7350	5500	5750	5100	5500	3550
Pressure (bar)	Rated	400	450	450	450	400	450	400	450	450
	Max.	450	530	530	530	450	530	450	530	500
Casting pressure[*1]	Rated (bar)	6								
	Max. (bar) (Short-time peak pressure)	10								
Max. output torque (N·m), (ΔP =450bar)		179 (ΔP = 400bar)	444	610	828	1019 (ΔP = 400bar)	1230	1273 (ΔP = 400bar)	1550	2006
Weight (Kg) (Approximate value)		21.5	31	39	46	67	62	78	78	101
Oil viscosity (mm^2/s)		10~1000, Best range: 16~36								
Oil Temperature ( )		-25 ~ 103								
Oil Cleanliness		ISO 4406 20/18/15								
Moment of inertia ($kg \cdot m^2$)		0.0014	0.0043	0.0072	0.0110	0.0253	0.0213	0.0353	0.0303	0.0479

1. Low-temperature rated at 3 bar, with an instantaneous peak of 6 bar. (!

Type Introduction

Product series

		28	60	85	115	160	170	200	215	280	Code
	Bent-axial Variable Piston Motor (Flange-type motor)	○	●	●	●	●	●	●	●	●	M60V
	Bent-axial Variable Piston Motor (Plug-in motor)	●	●	●	●	●	●	●	●		M60VE

Size

	Size	28	60	85	115	160	170	200	215	280

Control type

Type introduction

Mounting flange

Mounting flange (M60V)	28	60	85	115	160	170	200	215	280	Code
ISO 3019-2 125-4		●								M4
SAE J744 127-4			●							C4
ISO 3019-2 140-4			●							N4
SAE J744 152-4				●	●	●				D4
ISO 3019-2 160-4				● ●						

Type introduction

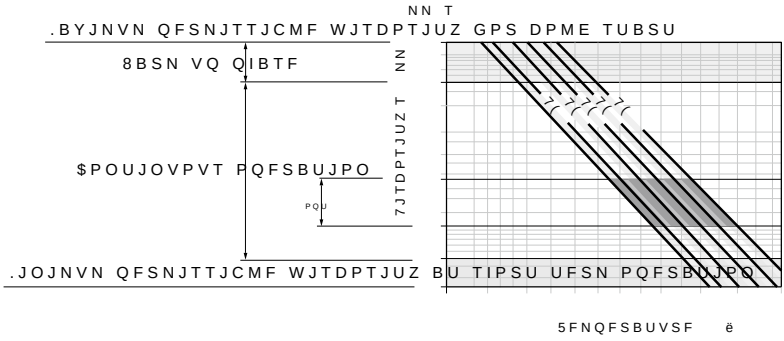
Input shaft

Seal type

	O ring seal (ISO 6149)	A
	Elastomeric sealing (ISO 9974)	E

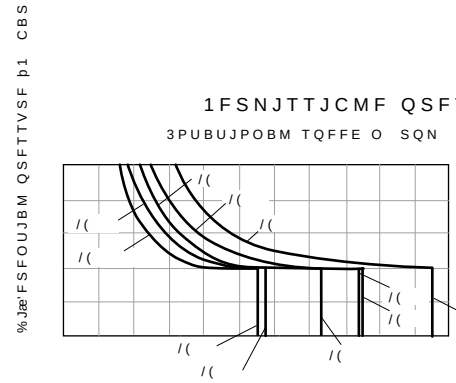
Seal Material

Balance valve

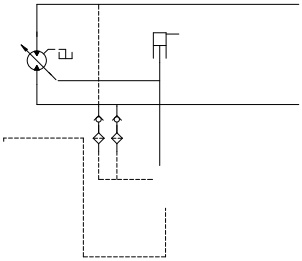

NN T
.BYJNVN QFSNJTTJCMF WJTDPTJUZ GPS DPME TUBSU
8BSN VQ QIBTF
NN
7JTDPTJUZ T
$POUJOVPVT PQFSBUJPO
PQU
.JOJNVN QFSNJTTJCMF WJTDPTJUZ BU TIPSU UFSN PQFSBUJPO
5FNQFSBUVSF ë

· Viscosity and temperature of hydraulic fluids

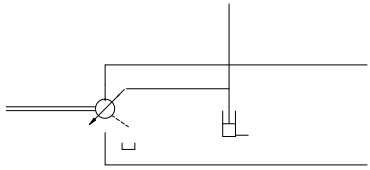
	Viscosity (mm^2/s)	Shaft seal	Temperature	Comment
Cold start	$\nu_{max} \leq 7400$ (1600)	NBR	θSt ≥ -40	t ≤ 3min, without load(p ≤ 725psi(50bar), n ≤ 1000rpm Permissible temperature difference between axial piston uni e
				dhu t ! tumpmax)mum t0 M 855pq , Π -
				2 hase //d ʎ ≤ 10men, w ≤ 7.8(p ʌ o noon! <



Principle



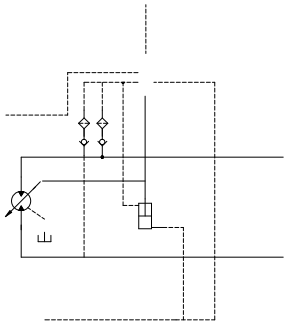
P r inciple



Principle

· H-Hydraulic Proportional Control

The hydraulic proportional displacement control valve is installed on the motor. The motor displacement is proportional to the pilot pressure, X is pilot pressure port.



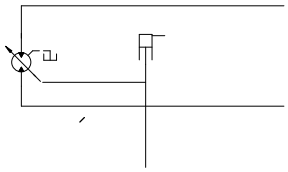
H5(negative control, increment of pilot pressure is 10 bar). Beginning of control at Vg max, End of control at Vg min. The motor displacement will increase from maximum to minumum when pilot pressure increases by 10 bar.Setting range of the displacement change point of pilot pressure is 2 to 20 bar.

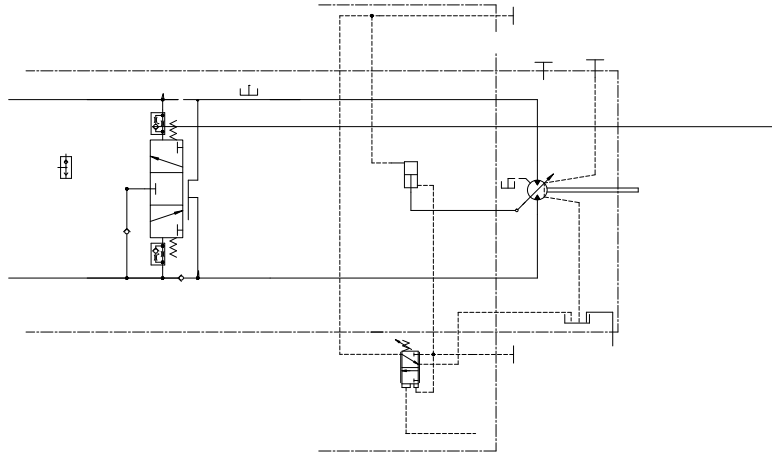
H6(negative control, increment of pilot pressure is 25 bar). Beginning of control at Vg max, End of control at Vg min. The motor displacement will increase from maximum to minumum when pilot pressure increases by 25 bar.Setting range of the displacement change point of pilot pressure is 5 to 35 bar.

P r inciple

· V-A u t oma t ic High P r e s s u r e Rela t ed Con t r ol

Automatic high pressure related control means the motor displacement will change automatically accroding to the working pressure,the wally





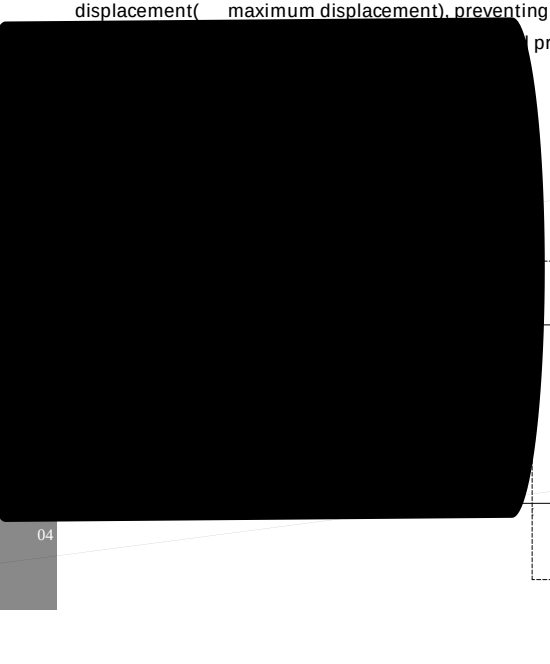
Principle (With Counter Balance Valve)

· V1T3+BVD (Automatic High Pressure Related Control + Remote Pressure control + Counter Balance Valve)

V1T3BVD(Automatic High Pressure Related Control + Remote pressure control + Counter Balance Valve + Second Small Displacement Control, increment of working pressure P ≤ 10bar, Spool of balance valve without internal orifice, control system has high pressure relief valves.)

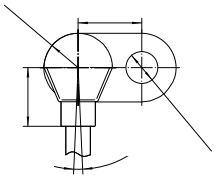
For the HA2T3 control mode, in spite of working pressure from A or B port will provide the control valve pressure,the beginning of control can be influenced by applying a pilot pressure to port X. The beginning of control is reduced by 17 bar per 1 bar pilot pressure.

S port is boost port, boost hydraulic fuid can reduce the risk that motor vacuums during braking. When the motor is working(fuid fows from port B to port A), balance valve opened, hydraulic fuid fows out of port A through the balance valve, when the hydraulic system is standby, no fuid fows into port B, balance valve closed, second small displacement control valve opened, hydraulic fuid pushes the piston of second small displacement control, motor displacement changes from the minumum to the larger displacement(maximum displacement), preventing the motor from stalling and sucking out. The high protection.



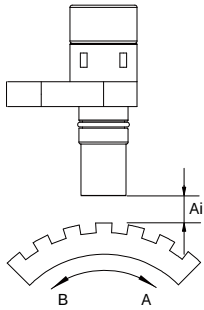
Speed sensor

The speed sensor is installed on the motor, which can record the motor speed and detect the direction of rotation of the motor.



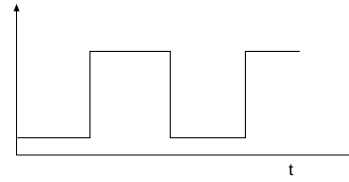
Speed sensor

· Output signal



A = Clockwise
B = Anticlockwise

Gear Module	Air gap
Modulus2	0.2~2mm



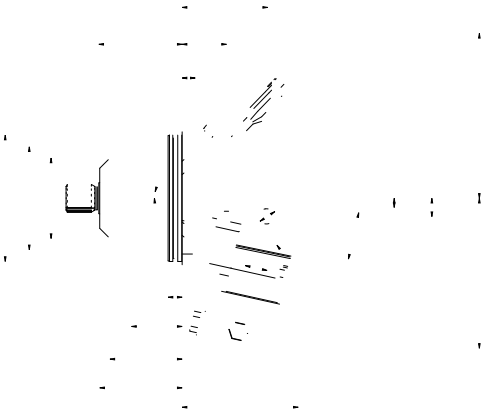
Phase difference

Phase difference

Installation size

M60VE28 Installation size

Plug-in motor



Installation size

· M60VE28 Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

· M60VE28 Port details

Installation size

M60VE28 Mounting Flange and Input Shaft Dimensions

Installation size

· M60V 60 Direction of rotation and oil flow direction

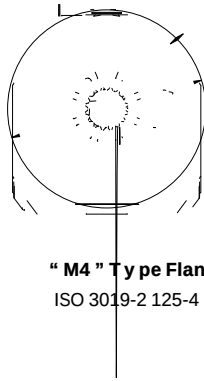
Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

· M60V 60 Port details

	Port name	Port size and description	Tightening torque (N·m)
A B	Inlet port and Delivery port	SAE J518 3/4″ M10 × 1.5 (depth 17mm)	57
TI	Case drain port	ISO 6149 M22 × 1.5 (depth 15.5mm)	100
T2		ISO 6149 M27 × 2 (depth 19mm)	- (Plastic plug)
G	Measuring port pressure	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
U	Flushing port	ISO 6149 M18 × 1.5 (depth 14.5mm)	70
M1	Measuring port pressure	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
Sa	External fushing port	ISO 6149 M22 × 1.5 (depth 16.5mm)	80

Installation size

· M60V 60 Mounting Flange and Input Shaft Dimensions



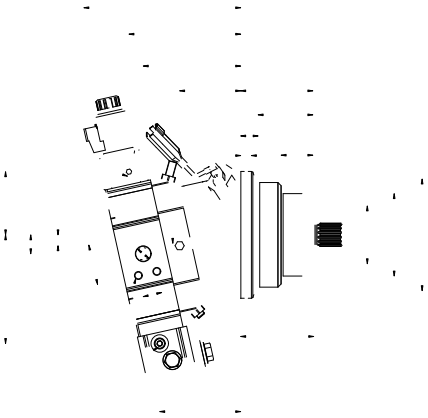
“M4” Type Flange
ISO 3019-2 125-4

Type “B” Input Shaft

Code	D1	D2	D3	M	L1	L2	L3	L4	L5	L6	L7
B8	125	73	45	M12	72.1	40	33	28	9.5	31	7.5

Installation size

M60VE60 Installation size



Installation size

- **M60VE60 Direction of rotation and oil flow direction**

- **M60VE60 Port details**

Installation size

M60VE60 Mounting Flange and Input Shaft Dimensions

“P2” Type Flange
ISO 3019-2 160-2

Installation size

· M60V 85 Direction of rotation and oil flow direction

· M60V 85 Port details

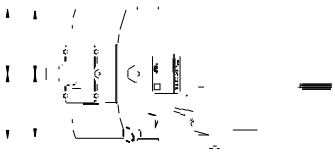
5

Installation size

· M60V85 Port details

Installation size

M60VE85 Installation size



Installation size

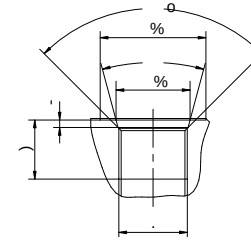
· M60VE85 Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

· M60VE85 Port details

	Port name	Port size and description	Tightening torque (N·m)
A B	Inlet port and Delivery port	SAE J518 1″ M12 × 1.75 (depth 17mm)	98
TI	Case drain port	ISO 6149 M22 × 1.5 (depth 15.5mm)	45
T2		ISO 6149 M22 × 1.5 (depth 15.5mm)	45
G	Measuring port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
M1		ISO 6149 M14 × 1.5 (depth 11.5mm)	45

Port	H	L	M	D	D1	
T1	15.5	2.4	M22 × 1.5	23.8	29	30°
T2	15.5	2.4	M22 × 1.5	23.8	29	30°
G	11.5	2.4	M14 × 1.5	15.8	22	30°
M1	11.5	2.4	M14 × 1.5	15.8	22	30°



Installation size

M60VE85Mounting Flange and Input Shaft Dimensions

“Y2” Type Flange
ISO 3019-2 190-2

Installation size

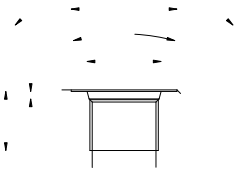
· M60V 115 Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

· M60V 115 Port details

	Port name	Port size and description	Tightening torque (N·m)
A B	Inlet port and Delivery port	SAE J518 1''M12 × 1.75 (depth 17mm)	98
TI	Case drain port	ISO 6149 M27 × 2 (depth 19mm)	90
T2		ISO 6149 M33 × 2 (depth 19mm)	120
G	Measuring port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
U	Flushing port	ISO 6149 M18 × 1.5 (depth 14.5mm)	45
X	Pilot port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
M1	Measuring port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45

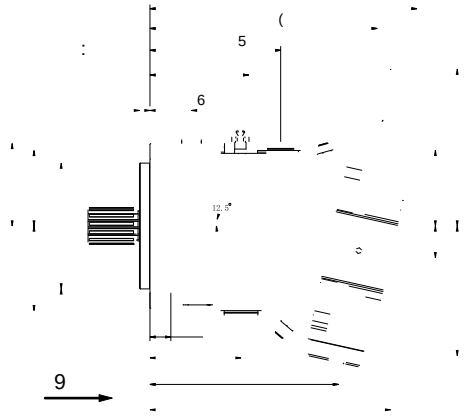
Port	H	L	M	D	D1	
T1	19	3.1	M27 × 2	29.4	34	30°
T2	19	3.1	M33 × 2	35.4	43	30°
G	11.5	2.4	M14 × 1.5	15.8	22	30°
U	14.5	2.4	M18 × 1.5	19.8	28	30°
X	11.5	2.4	M14 × 1.5	15.8	22	30°
M1	11.5	2.4	M14 × 1.5	15.8	22	30°



Installation size

M60V 115 Installation size

SAE Flange-type motor



9 7JFX

: 7JFX

; 7JFX

Installation size

· M60V 115 Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

· M60V 115 Port details

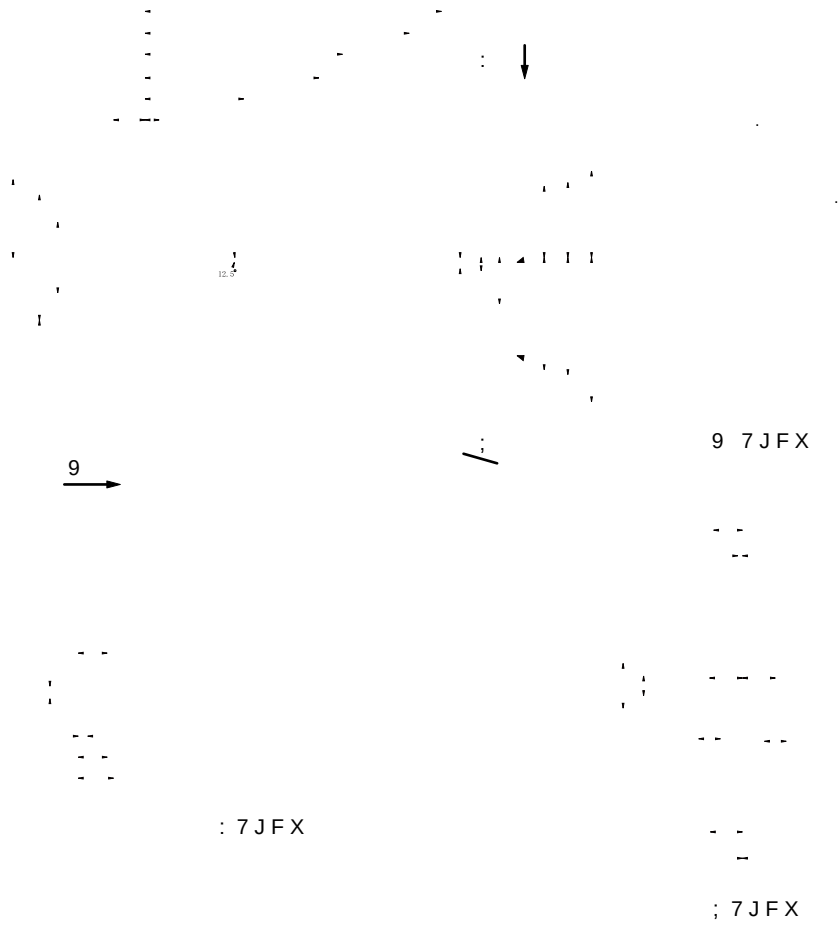
	Port name	Port size and description	Tightening torque (N·m)
A B	Inlet port and Delivery port	SAE J518 1''M12 × 1.75 (depth 17mm)	98
TI	Case drain port	ISO 6149 M27 × 2 (depth 19mm)	90
T2		ISO 6149 M33 × 2 (depth 19mm)	120
G	Measuring port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
U	Flushing port	ISO 6149 M18 × 1.5 (depth 14.5mm)	45
X	Pilot port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
M1	Measuring port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45

Port	H	L	M	D	D1	
T1	19	3.1	M27 × 2	29.4	34	30°
T2	19	3.1	M33 × 2	35.4	43	30°
G	11.5	2.4	M14 × 1.5	15.8	22	30°
U	14.5	2.4	M18 × 1.5	19.8	28	30°
X	11.5	2.4	M14 × 1.5	15.8	22	30°
M1	11.5	2.4	M14 × 1.5	15.8	22	30°

Installation size

M60V 115 Installation size

Flange-type motor,
With balance valve



- Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

· M60V 115 Port details

Installation size

M60V115 Mounting Flange and Input Shaft Dimensions

“D4” Type Flange
ISO 3019-1 152-4

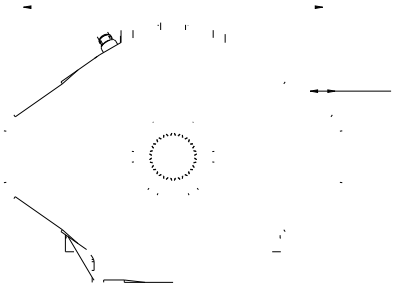
“A3” Type Input Shaft

Code	D1	D2	D3	M	L1	L2	L3	L4	L5	L6	L7	L8
A3	136	60	-	M12 × 12	75	67	55	43	12	109.5	-	-

B9	160	90	60	M16	85	45	36.9	37	12	40	39	7.5
A1					90	49.7	41.7	43	12			
B1				M12	85	45	36.9	26	9.5			
B4				M16	102	61.65	52.3	43	12			

Installation size

M60VE115 Mounting Flange and Input Shaft Dimensions



"S2" Type Flange
ISO 3019-2 200-2

"B" Type Input Shaft

Code	D1	D2	D3	D4	D5	D6	M	L1	L2	L3	L4	L5	L6	L7	L8	L9
B9	200	168	160	132	90	60	M16	168	45	36.9	37	12	121.8	73	35	15

Installation size

· M60V 160 Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

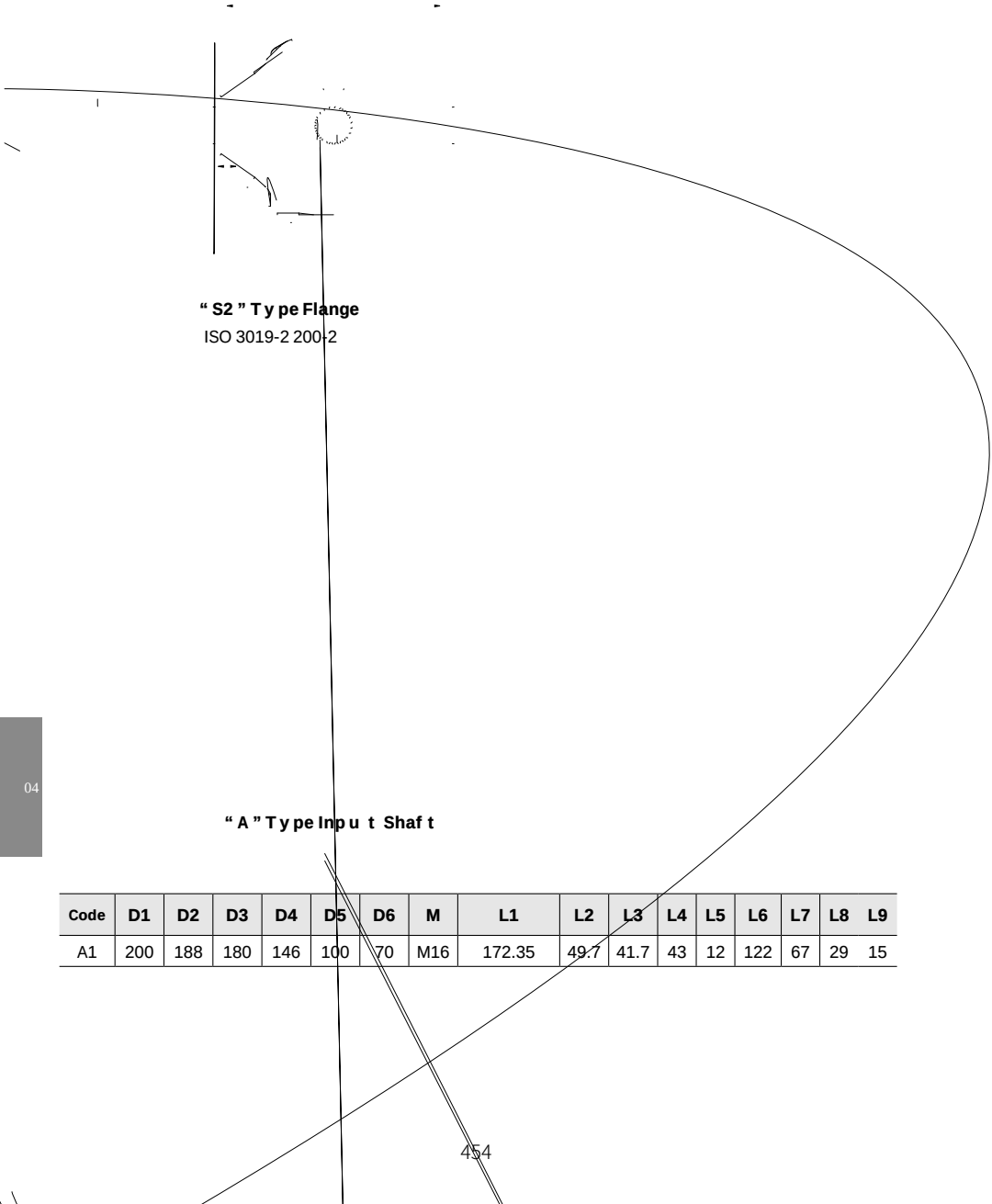
· M60V 160 Port details

	Port name	Port size and description	Tightening torque (N·m)
A B	Inlet port and Delivery port	SAE J518 1 1/4" M14 × 2 (depth 19mm)	-
TI	Case drain port	DIN 3852 M26 × 1.5 (depth 23mm ED seals)	110 ± 10
T2		DIN 3852 M26 × 1.5 (depth 18mm ED seals)	110 ± 10
G	Synchronous control port	DIN 3852 M14 × 1.5 (depth 15mm ED seals)	40 ± 5
U	Flushing port	DIN 3852 M22 × 1.5 (depth 20mm ED seals)	45 ± 5
MA MB	Measuring port	DIN 3852 M14 × 1.5 (depth 12mm ED seals)	40 ± 5

Port	H	M	D	
T1	23	M26 × 1.5	26	90°
T2	18	M26 × 1.5	26	90°
G	15	M14 × 1.5	14	90°
U	20	M22 × 1.5	22	90°
MA MB	12	M14 × 1.5	14	90°

Installation size

M60VE160 Mounting Flange and Input Shaft Dimensions



“S2” Type Flange
ISO 3019-2 200-2

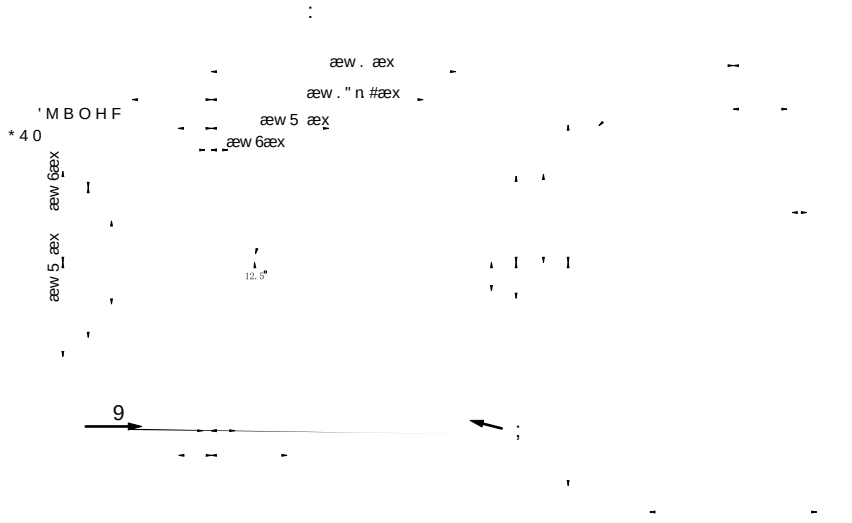
“A” Type Input Shaft

Code	D1	D2	D3	D4	D5	D6	M	L1	L2	L3	L4	L5	L6	L7	L8	L9
A1	200	188	180	146	100	70	M16	172.35	49.7	41.7	43	12	122	67	29	15

Ins t alla t ion s i z e

M60V 170 Ins t alla t ion s i z e

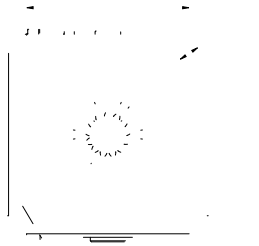
Flange-type motor



9 7JFX

: 7JFX

; 7JFX



Installation size

M60V 170 Installation size	Plug-in motor, With balance valve

· Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

Installation size

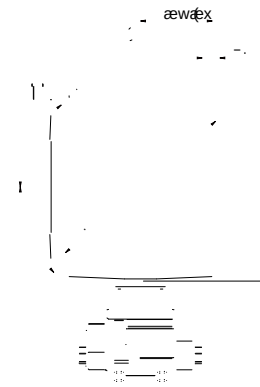
M60VE170 Mounting Flange and Input Shaft Dimensions

“S2” Type Flange
ISO 3019-2 200-2

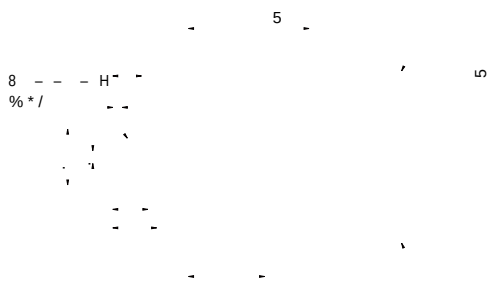
Ins talla t ion s i z e

M60V 200 Ins t alla t ion s i z e

Flange-type motor



9 7JFX



; 7JFX

Installation size

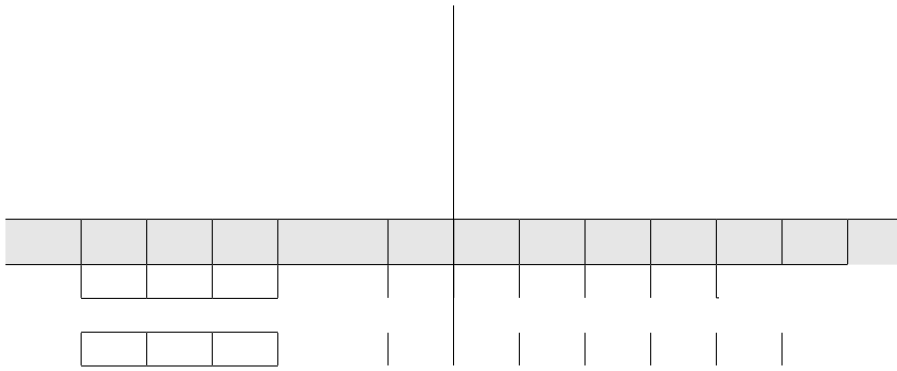
· M60V 200 Direction of rotation and oil flow direction

· M60V 200 Port details

Installation size

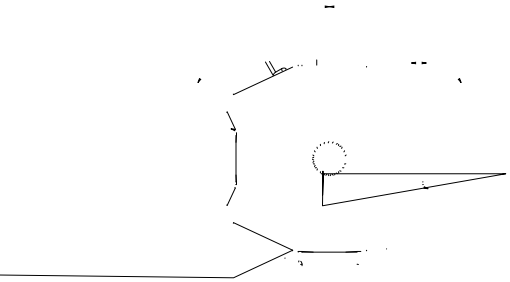
M60V200 Mounting Flange and Input Shaft Dimensions

“S4” Type Flange
ISO 3019-2 200-4



Installation size

M60VE200 Mounting Flange and Input Shaft Dimensions



“E4” Type Flange
ISO 3019-2 260-4

“A” Type Input Shaft

Code	D1	D2	D3	M	L1	L2	L3	L4	L5	L6	L7
A2	260	123	70	M16	187.5	55	44	36	12	131.5	14

Ins t alla t ion s i z e

M60V 215 Ins t alla t ion s i z e

Flange-type motor

9 7 J F X

5

. . . # . "

. " –c70"1 à 0 lwP2à 8" •™f0)f0" –l@ • à 0 b—P2à ! F V" Y ‡Û ` ðpƒ–ƒ"' •˜ ! `

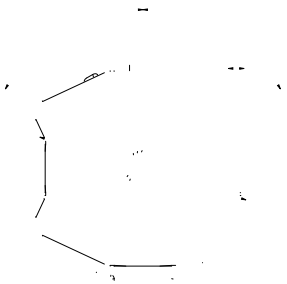
; 7 J F X

Installation size

· M60V 215 Direction of rotation and oil flow direction

· M60V 215 Port details

	Port name	Port size and description	Tightening torque (N·m)
A B	Inlet port and Delivery port	SAE J518 1 1/4" M14×2 (depth 20mm)	157
TI	Case drain port	ISO 6149 M33×2 (depth 20mm)	215
T2		ISO 6149 M42×2 (depth 20mm)	330
G	Measuring port	ISO 6149 M14×1.5 (depth 11.5mm)	45
U	Flushing port	ISO 6149 M22×1.5 (depth 11.5mm)	45
M1	Measuring port	ISO 6149 M14×1.5 (depth 11.5mm)	45



Installation size

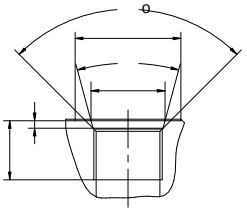
· M60V 280 Direction of rotation and oil flow direction

Installation	Rotation
Flow A → B	Clockwise
Flow B → A	Counter-clockwise

· M60V 280 Port details

	Port name	Port size and description	Tightening torque (N·m)
A B	Inlet port and Delivery port	SAE J518 1 1/4" M14 × 2 (depth 19mm)	187
TI	Case drain port	ISO 6149 M42 × 2 (depth 20mm)	330
T2		ISO 6149 M33 × 2 (depth 20mm)	215
G	Measuring port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
U	Flushing port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45
M1	Measuring port	ISO 6149 M14 × 1.5 (depth 11.5mm)	45

Port	H	L	M	D	D1	
T1	20	3.1	M33 × 2	35.4	43	30°
T2	20	3.1	M42 × 2	44.4	52	30°
G	11.5	2.4	M14 × 1.5	15.8	25	30°
U	11.5	2.4	M14 × 1.5	15.8	25	30°
M1	11.5	2.4	M14 × 1.5	15.8	25	30°



Installation size

M60V280 Mounting Flange and Input Shaft Dimensions

-

“S4” Type Flange
ISO 3019-2 200-4

“T4” Type Flange
SAE J744 165-4

“A” Type Input Shaft

Code	D1	D2	D3	M	L1	L2	L3	L4	L5	L6	L7
A2	200	152.7	70	M16	105	55	44	36	12	48	14
A5				M20	120	72	59	42	15		