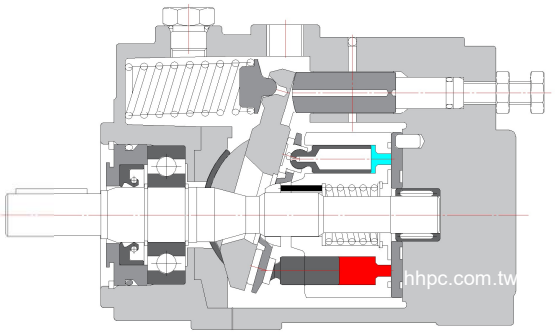
Principle

P*



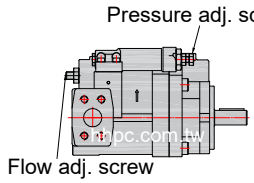
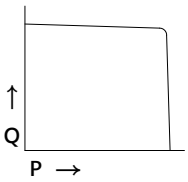
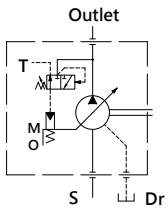
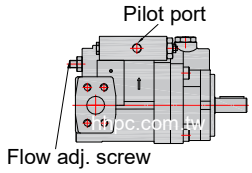
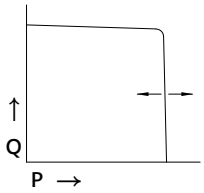
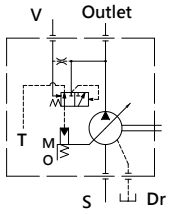
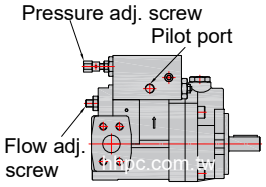
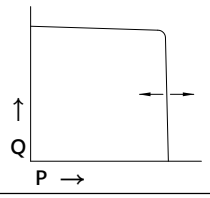
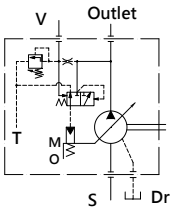
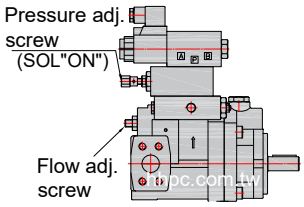
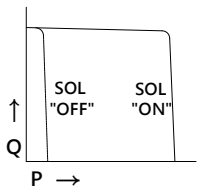
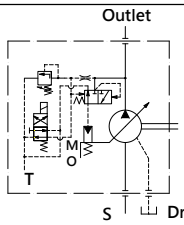
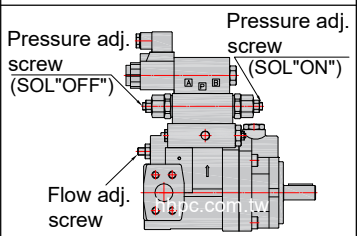
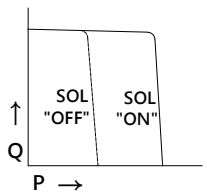
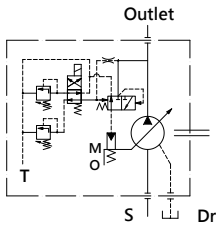
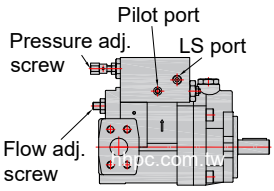
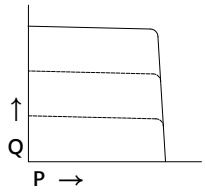
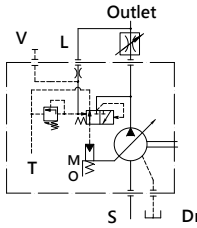
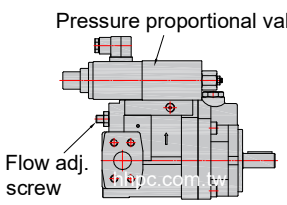
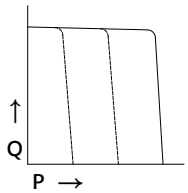
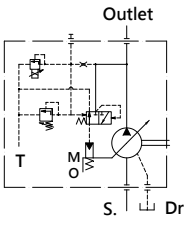
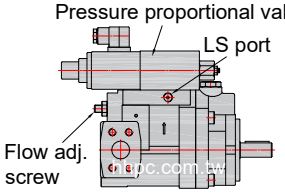
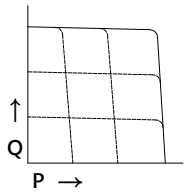
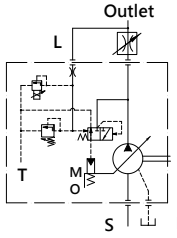
Cross section

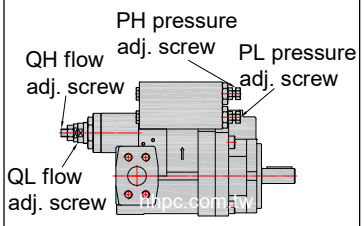
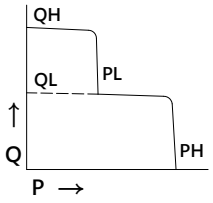
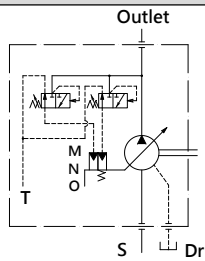
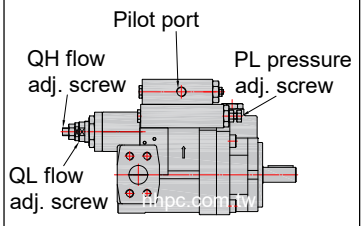
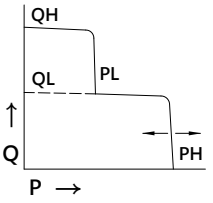
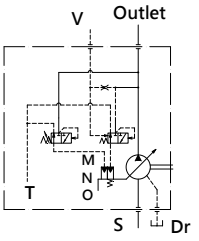
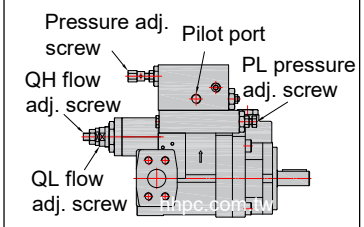
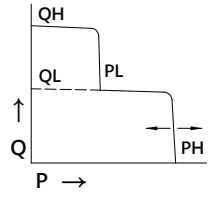
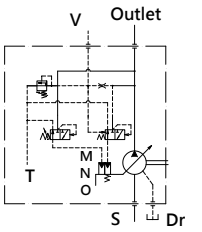
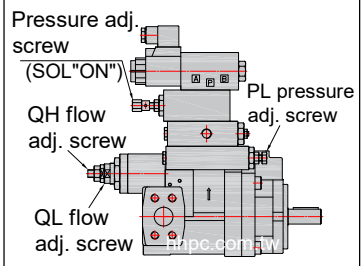
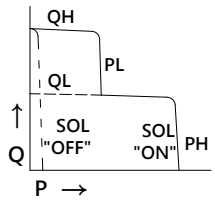
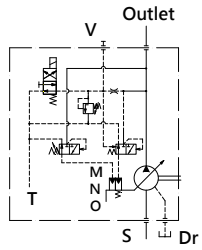
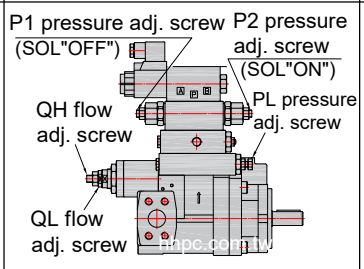
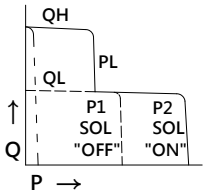
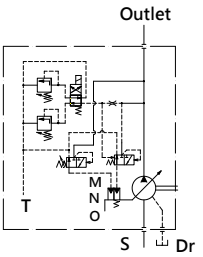
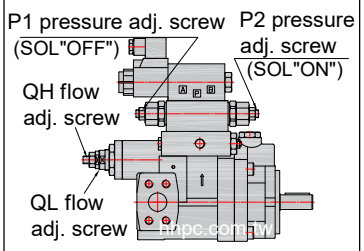
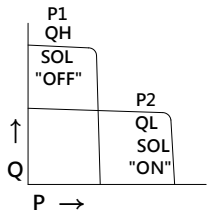
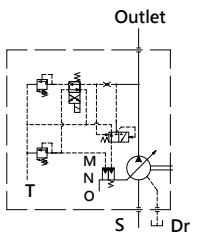
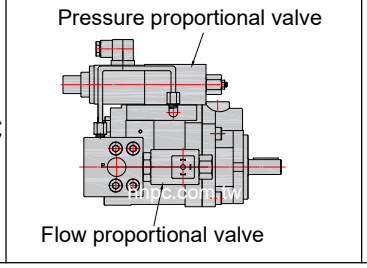
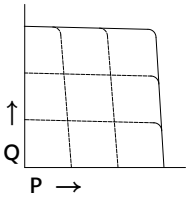
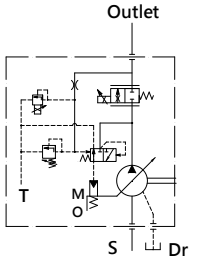
Specifications

		08	10	13	16	22	36	46	70	100
Displacement	cm^3/rev	8	10	13.5	16.5	22	36	46	70	100
Pressure (Max)	bar	210	210	210	210	210	210	210	280	280
Pressure (Peak)	bar	255	255	255	255	255	255	255	280	280
Min speed	rpm	300	300	300	300	300	300	300	300	300
Max speed	rpm	2000	2000	2000	2000	2000	2000	2000	1800	1800
Weight	kg	9	9	9	13	13	22	22	43	62
Rotation		Clockwise or Counter-clockwise								

Notice of operating

Pressure at suction port (inlet)	-0.3/+0.3 bar
Recommended viscosity	+20/+50 mm^2/s
Ambient temperature range	+5/+60 °c
Degree of fluid contamination	21/19/16 ISO 4406 *Class 10 (NAS 1638)*

Code	External View	Characteristics	Circuit	Description
A Page.6				**Pressure compensating type** •When the pressure reaches the compensator setting, the flow automatically reduces to the minimum. •Pressure setting can be adjusted manually.
B Page.8				**Remote pressure control type** •The pressure can be controlled by using the remote relief valve or the multistage pressure control valve. •The discharge pressure can be adjusted by using the remote relief valve.
BH Page.9				**Remote pressure control & manual pressure type** •The pressure can be controlled by using the remote relief valve or the multistage pressure control valve. •Pressure compensator safety relief valve integrated.
D Page.10				**Solenoid cut-off control type** •The pump can be switched to unloading type and pressure control type by using the solenoid valve. •If the system has long standby time, using this type of pump can minimize the consumption of energy.
E Page.12				**Solenoid two pressure control type** •The pump can be switched to high-pressure type and low-pressure type by using the solenoid valve. •This control is suitable for two different load pressures.
HL Page.14				**Load sensing control type** •This regulator, in addition to the pressure adjustment, allows the pump flow rate control, according to the pressure drop measured on either side of a throttle valve installed on the user line. •This control provides the minimum flow required for the load and the full shut-off pressure.
BH-EDG Page.16				**Pressure proportional control & manual pressure type** •The pressure can be controlled by using the proportional pressure control valve. •The pump is equipped with manual adjustment for maximum pressure protection control.
HL-EDG Page.18				**Load sense with pressure proportional control type** •When the discharge outlet passes through a flow control valve, feedback of the pressure difference to the pump's load-sensing port is necessary, utilizing load sensing for automatic pump flow control. •The pressure can be controlled by using the proportional pressure control valve.

Code	External View	Characteristics	Circuit	Description
C-A Page.22				**2-pressure, 2-flow rate control type** •The discharge volume changes in two stages by the pump's built-in sequence valve. This allows conventional high/ low pressure control to be performed on a single pump unit and save energy in the hydraulic circuit.
C-B Page.24				**2-pressure, 2-flow rate with remote control PH pressure type** •The pump reaches high flow rate when it is in the low-pressure stage. On the contrary, the pump reaches low flow rate when it is in the high-pressure stage. •The high pressure can be controlled by using the remote relief valve.
C-BH Page.25				**2-pressure, 2-flow rate with remote control PH pressure & manual pressure type** •The pump reaches high flow rate when it is in the low-pressure stage. On the contrary, the pump reaches low flow rate when it is in the high-pressure stage. •The high pressure can be controlled by using the remote relief valve. •Pressure compensator safety relief valve integrated.
C-D Page.26				**2-pressure, 2-flow rate with solenoid cut-off control type** •The pump reaches high flow rate when it is in the low-pressure stage. On the contrary, the pump reaches low flow rate when it is in the high-pressure stage. •The pump can be switched to unloading type and pressure control type by using the solenoid valve.
C-E Page.28				**2-pressure, 2-flow rate with solenoid two PH pressure control type** •The pump reaches high flow rate when it is in the low-pressure stage. On the contrary, the pump reaches low flow rate when it is in the high-pressure stage. •Under low flow rate, the high pressure can be obtained by switching the solenoid valve.
CL-H Page.30				**2-pressure, 2-flow rate with solenoid two pressure control type** •The pump reaches high flow rate when it is in the low-pressure stage. On the contrary, the pump reaches low flow rate when it is in the high-pressure stage. •The low flow rate and the high flow rate can be switched by the solenoid valve.
HL-EDPV **HL-EDPFC** Page.20				**Load sense with pressure, flow proportional control type** •Full shut-off pressure and discharge volume are controlled by the input current ratio of the power amplifier. The system enables multi-stage pressure and flow control, with manual maximum pressure protection on the pump.

Ordering code

P	16	-	A	3	-	ED*	-	F	-	R	-	(S)	-	01

P series

Displacement
08 = 8 cm³/rev
10 = 10 cm³/rev
13 = 13.5 cm³/rev
16 = 16.5 cm³/rev
22 = 22 cm³/rev
36 = 36 cm³/rev
46 = 46 cm³/rev
70 = 70 cm³/rev
100 = 100 cm³/rev

Pressure
0:15-45 bar (P08-P46)
1:20-75 bar (P08-P100)
2:25-145 bar (P08-P100)
3:30-215 bar (P08-P100)
4:30-280 bar (P70-P100)

Mounting flange
SAEJ 744

Rotation
R: Clockwise
L: Counter-clockwise

Drive shaft
Ignore: Standard
S : Spline

Design code

Thread Type	P08-P70	P100
PT	01	02
SAE	20	20
BSP(G)	30	32
NPT	40	42

Control type:
A = Pressure compensating type
B = Remote pressure control type
BH =Remote pressure control & manual pressure control type
D =Solenoid cut-off control type
E =Solenoid two pressure control type
HL =Load sensing control type

Control type(additional):
EDG=Electro-Hydraulic Proportional control type
*Applicable only for BH and HL types
EDPV(EDPFC)=Pressure, flow proportional control type
**Applicable only for HL type

Ordering code

P	16	-	C	1	-	A	3	-	F	-	R	-	(S)	-	01

P series

Displacement
16 = 16.5 cm^3/rev
22 = 22 cm^3/rev
36 = 36 cm^3/rev
46 = 46 cm^3/rev
70 = 70 cm^3/rev
100 = 100 cm^3/rev

Mounting flange
SAEJ 744

Rotation
R: Clockwise

Drive shaft
Ignore: Standard
S : Spline

Design code

Thread Type	P08-P70	P100
PT	01	02
SAE	20	20
BSP(G)	30	32
NPT	40	42

	High flow side		Low flow side	
2-pressure, 2-flow rate control type	C	0:15-45 bar (P16-P46) 1:20-75 bar (P16-P100) 2:25-145 bar (P16-P100)	A	2:25-145 bar (P16-P100) 3:30-215 bar (P16-P100) 4:30-280 bar (P70-P100)
2-pressure, 2-flow rate with remote control PH pressure type	C		B	
2-pressure, 2-flow rate with remote control pressure type & manual pressure type	C		BH	
2-pressure, 2-flow rate with solenoid cut-off control type	C		D	
2-pressure, 2-flow rate with solenoid two PH pressure control type	C		E	2:25-145 bar (P16-P100) 3:30-215 bar (P16-P100)
2-pressure, 2-flow rate with solenoid two pressure control type	CL		H	

Front pump ordering code

PP	16	-	A	3	-	ED*	-	F	-	R	-	(S)	-	

Rear pump ordering code

P	16	-	A	3	-	ED*	-				-	S

P series
PP series

Displacement
16 = 16.5 cm^3/rev
22 = 22 cm^3/rev
36 = 36 cm^3/rev
46 = 46 cm^3/rev
70 = 70 cm^3/rev
100 = 100 cm^3/rev

Pressure
0:15-45 bar (P08-P46)
1:20-75 bar (P08-P100)
2:25-145 bar (P08-P100)
3:30-215 bar (P08-P100)
4:30-280 bar (P70-P100)

Control type:
A = Pressure compensating type
B = Remote pressure control type
BH =Remote pressure control & manual pressure control type
D =Solenoid cut-off control type
E =Solenoid two pressure control type
HL =Load sensing control type

Mounting flange
SAEJ 744

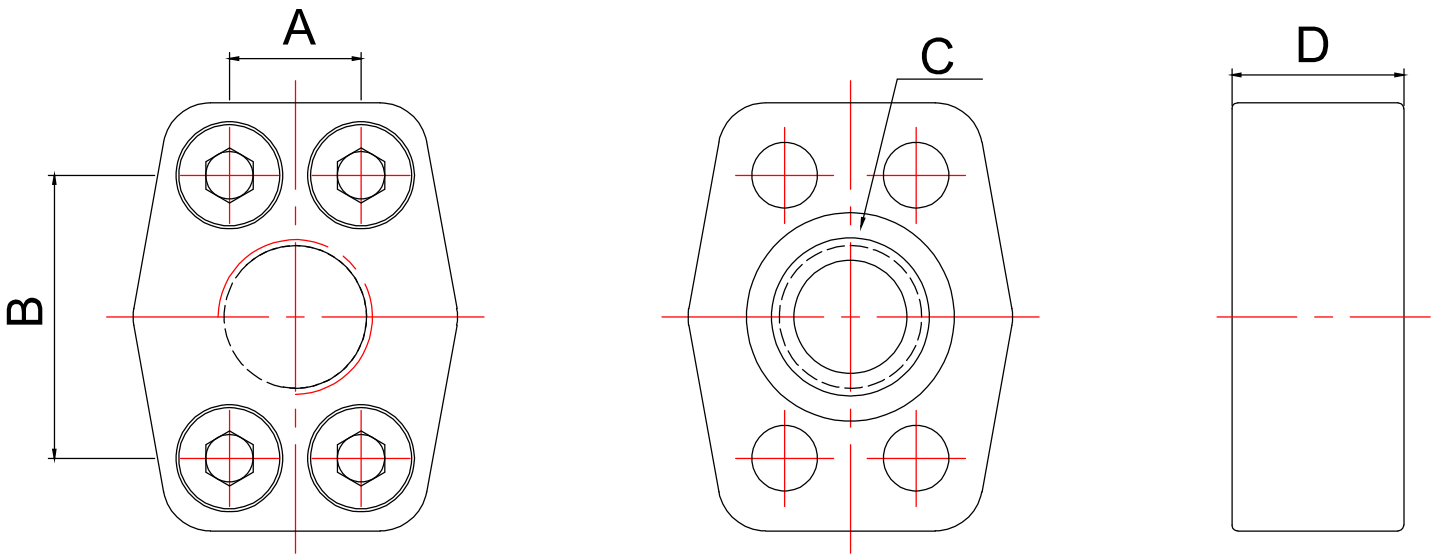
Drive shaft
K: Standard (front pump ignore)
S: Spline

Rotation
R: Clockwise
L: Counter-clockwise (non standard)

Design code

Code	Flange	Through drive
2A	Φ82.55	SAE-A-9T
2AA	Φ82.55	SAE-A-Φ19.05
2B	Φ101.6	SAE-B-13T
4C	Φ127	SAE-C-14T
4D	Φ152.4	SAE-CC-17T

Control type(additional):
EDG=Electro-Hydraulic Proportional control type
*Applicable only for BH and HL types
EDPV(EDPFC)=Pressure, flow proportional control type
**Applicable only for HL type



Model	P16		P22		P36	
Port	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
A	26.2	22.2	26.2	22.2	30.2	26.2
B	52.4	47.6	52.4	47.6	58.7	52.4
C	NBR-G35	NBR-G30	NBR-G35	NBR-G30	NBR-G40	NBR-G35
D	30	30	30	30	31	30
Bolt	M10	M10	M10	M10	M10	M10
Pipe	Rc 3/4"	Rc 3/4"	Rc 1"	Rc 3/4"	Rc 1-1/4"	Rc 1"
Part number	M00021	M00020	M00030	M00020	M00040	M00030
Model	P46		P70		P100	
Port	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
A	30.2	26.2	35.7	30.2	42.9	31.8
B	58.7	52.4	69.9	58.7	77.8	66.7
C	NBR-G40	NBR-G35	NBR-G50	NBR-G40	NBR-G65	NBR-G45
D	31	30	31	31	31	31
Bolt	M10	M10	M12	M10	M12	M14
Pipe	Rc 1-1/4"	Rc 1"	Rc 1-1/2"	Rc 1-1/4"	Rc 2"	Rc 1-1/4"
Part number	M00040	M00030	M00050	M00040	M00060	M00041

Memo: The pipe flange type is not applicable to P08.

Symbol	Control type	P08-P13	P16-P46	P70-P100
A	**Pressure compensating type**	V	V	V
B	**Remote pressure control type**	V	V	V
BH	**Remote pressure control & manual pressure type**	V	V	V
D	**Solenoid cut-off control type**	V	V	V
E	**Solenoid two pressure control type**	V	V	V
HL	**Load sensing control type**	V	V	V
BH EDG	**Pressure proportional control & manual pressure type**	V	V	V
HL EDG	**Load sense with pressure proportional control type**	V	V	V
C-A	**2-pressure, 2-flow rate control type**		V	V
C-B	**2-pressure, 2-flow rate with remote control PH pressure type**		V	V
C-BH	**2-pressure, 2-flow rate with remote control PH pressure & manual pressure type**		V	V
C-D	**2-pressure, 2-flow rate with solenoid cut-off control type**		V	V
C-E	**2-pressure, 2-flow rate with solenoid two PH pressure control type**		V	V
CL-H	**2-pressure, 2-flow rate with solenoid two pressure control type**		V	V
HL EDPV (HL EDPFC)	**Load sense with pressure, flow proportional control type**		V	V