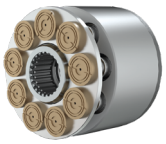
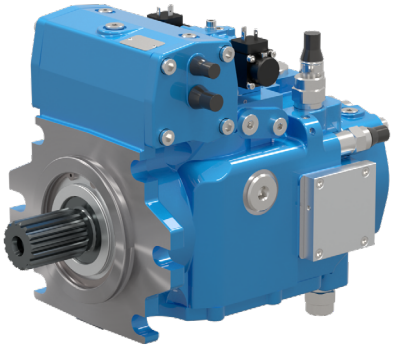




Index

Type	**Displacement** cm³/rev [in³/rev]	**Max. flow** l/min [U.S. gpm]	**Max. pressure cont.** bar [psi]
S6CV 075	75 [4.57]	255 [67.32]	400 [5800]
S6CV 128	128 [7.8]	365 [96.3]	400 [5800]

The S6CV series variable piston pumps for closed loop circuits are axial pistons pumps with swash plate design and through drive shaft on option. These pumps have been specifically designed for use in closed circuit hydrostatic transmissions. The delivery is proportional to the rotation speed and the swash plate angle. The delivery increases when swash plate's angle of inclination increases from 0 to maximum position. Inverting the swash plate's angle, the flow direction is inverted. The technical choices allow the new unit to operate at pressures up to of 400 bar [5800 psi].

General information - Features

The series offers the following range of controls :
- HLR Manual lever with feed-back.
- HIR Hydraulic proportional with feed-back.
- HIN Hydraulic proportional without feed-back.
- HER Electric proportional with feed-back.
- HEN Electric proportional without feed-back.
- HE2 Electric on-off.
- HEH Electric proportional with hydraulic emergency override.
- Automotive

The pump has two built-in pressure relief valves to protect the circuit from pressure overloads. The charge pump circuit features a gerotor pump with different displacement on option.
The pump design allows the installation of many accessories, such as:
- Hydraulic pressure compensator.
- Electric cut-off valve.
- Combined electric cut-off – hydraulic pressure compensator.
- A wide range of through drive options.
- Charge pump delivery pressure filter.
- Electric or optical clogging sensor on the filter.

Simbology:

C	N/bar [lbf/psi]	Load
$F_{ax\ max}$	N [lbf]	Axial pushing load
$F_{ax\ max}$	N [lbf]	Axial pulling load
F_q	N [lbf]	Radial load
$F_{q\ max}$	N [lbf]	Maximum permissible radial load
J	kg·m^2 [lbf·ft^2]	Moment of inertia
m	kg [lbs]	Weight
$n_{0\ max}$	rpm	Maximum speed
p_{nom}	bar [psi]	Maximum cont. pressure
p_{max}	bar [psi]	Maximum pressure peak

q_{max}	l/min [U.S. gpm]	Maximum flow
q_d	l/min [U.S. gpm]	External drain flow
T_k	Nm/bar [lbf.ft/psi]	Torque costant
T_{nom}	Nm [lbf.ft]	Maximum torque at pressure cont.
T_{max}	Nm [lbf.ft]	Maximum torque at pressure peak
V_g	cm^3/rev [in^3/rev]	Displacement
P_{max}	kW [hp]	Maximum power at p_{nom}
η_{hm}	%	Mech-hyd. efficiency
η_v	%	Volumetric efficiency

Fluids:
Use fluids with mineral oil basis and anticorrosive, antioxidant and wear preventing addition agents (HL or HM). Viscosity range at operating temperature must be of 15 ÷ 40 cSt. For short periods and upon cold start, a max.viscosity of 800 cSt is allowed. Viscosities less then 10 cSt are not allowed. A viscosity range of 10 ÷15 cSt is allowed for extreme operating conditions and for short periods only. For further information see at Fluids and Filtration section.

Operating temperature:
The operating temperature of the oil must be within -25 °C ÷ 90 °C (-13 °F ÷ 194 °F). The running of the axial piston unit with oil temperature higher than 90 °C (194 °F) or lower than -25 °C (-13 °F) is not recommended. For further information see at Fluids and filtration section.

Filtration:
In the S6CV pump it is possible to provide a filter in the suction line but we recommend to use the optional pressure filter on the out-let line of the charge pump. The filter on the charge pump out-let line is supplied by Dana while if the filter assembled in the suction line is used the following recommendation applies:
Install the filter on the suction line of the auxiliary pump. We recommend to use filters with clogging indicator, no by-pass or with by-pass plugged and filter elementrating of 10 µm absolute. The maximum pressure drop on the filtration element must not exceed 0.2 bar [3 psi]. A correct filtration helps to extend the service life of axial piston units.In order to ensure a correct functioning of the unit, the max. permissible contamination class is 20/18/15 according to ISO 4406:1999.

Suction pressure:
The minimum absolute pressure on the auxiliary pump suction must be of 0.8 bar [11.6 absolute psi]. On cold starting and for short-periods an absolute pressure of 0.5 bar [7.25 psi] is allowed. In no case inlet pressure can be lower.

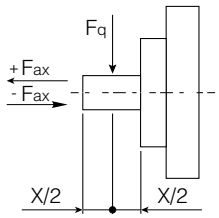
Operating pressure:
Main pump: The maximum permissible continuous pressure on pressure ports is over 400 bar [5800 psi]. Peak pressure is 450 bar [6525 psi]. Charge pump: The nominal pressure is 22 bar [319 psi]. Maximum admissible pressure is 40 bar [580 psi].

Case drain pressure:
Maximum case drain pressure is 4 bar [58 psi]. On cold starting and for short-term a pressure of 6 bar [86 psi] is allowed. A higher pressure can damage the input shaft seal or reduce its life.

Seals:
Standard seals used on S6CV pumps are of FKM (Viton ®). In case of use special fluids, contact Dana.

Displacement limiting:
The pump is equiped with the externally adjustable mechanical displacement limiting device. Displacement limitation is obtained by means of two setting screws which limit the control piston stroke.

Input shaft Radial and Axial loads:
The input shaft can stand both radial and axial loads. The maximum permissible loads are in the following table.



			Size	
			075	128
Radial load	$F_{q\ max}$	N [lbf]	2400 [540]	4600 [1035]
Axial load	$F_{ax\ max}$	N [lbf]	1900 [428]	4300 [967]

Installation:
S6CV series pumps can be installed in every position or direction. For further details contact Dana.

General information - Features

			Size	
			075	128
Displacement	$V_{g\ max}$	cm^3/rev [in^3/rev]	75[1] [4.57] [1]	128 [1] [7.8] [1]
Displacement	$V_{g\ min}$	cm^3/rev [in^3/rev]	0 [0]	0 [0]
Pressure cont.	p_{nom}	bar [psi]	400 [5800]	400 [5800]
Pressure peak	p_{max}	bar [psi]	450 [6525]	450 [6525]
Max speed cont.	$n_{0\ max}$	rpm	3400	2850
Max speed int.	$n_{0\ max}$	rpm	3600	3250
Min speed	n_{min}	rpm	500	500
Max flow at n_{max}	q_{max}	l/min [U.S.gpm]	255 [67.32]	365 [96.3]
Maximum power cont.	P_{max}	kW [hp]	170 [227.8]	259 [347]
Maximum power int.	P_{max}	kW [hp]	202.5 [271.3]	343 [459]
Max torque cont.(p_{nom}) at Vg_{max}	T_{nom}	Nm [lbf.ft]	478 [352]	858 [632]
Max torque peak (p_{max}) at Vg_{max}	T_{max}	Nm [lbf.ft]	537 [396]	980 [722]
Moment of inertia[2]	J	$kg \cdot m^2$ [$lbf.ft^2$]	0.014 [0.34]	0.040 [0.96]
Weight[2]	m	kg [lbs]	51 [112.5]	86 [189.5]

		Charge pump technical data		
Displacement charge pump	cm^3/rev [in^3/rev]	18 [1.1]	23 [1.4]	27 [1.6]
Charge pump setting pressure	bar [psi]	22 [319]		
Charge pump maximum pressure	bar [psi]	40 [580]		
Charge pump power cont. at 3400 rpm	kW [hp]	2.2 [2.95]	2.8 [3.75]	3.3 [4.4]
Maximum Pressure in the housing cont.	bar [psi]	4 [58]		
Maximum Pressure in the housing int	bar [psi]	6 [87]		

Theorical values, without considering the efficency; approximate values. Peak operations must not excide 1% of every minute. Avoid continuously working at simultaneusly maximum pressure and maximum speed.

Notes:

(1) For 075 displacement it is possible to achieve the displacement 81 cm^3/rev [4.941 in^3/rev]. For 128 displacement it is possible to achieve the displacement 136 cm^3/rev [8.296 in^3/rev]. Please contact our technical service for the technical specifications.

(2) Approximate values.

S6CV 075 - Ordering code

The following alphanumeric codes system has been developed to identify all of the configuration options for the S6CV 75 pumps.
Use the model code below to specify the desired features.
All alphanumeric digits system of the code must be present when ordering. We recommend to carefully read the catalogue before filling the ordering code.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Series	Pump	Size	Displacement limitation side A	Displacement limitation side B	Version	Flange	Shaft end	Direction of rotation	Control	Control feature	Charge pump	Pressure relief valve side A	Pressure relief valve side B	Charge pressure relief valve	Pressure compensator and cut-off valves	Cut-off valves feature	Filter	Through drive	Flushing valve	Pump feature	Painting
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

1

Series	
S6CV	Variable displacement axial piston pump for closed circuit

2

Pump	
P	Pump

3

Size	
075	75 cm^3/rev [4.575 in^3/rev]

4

Displacement limitation side A	
0+81	From 0 cm^3/rev to 81 cm^3/rev [4.940 in^3/rev]

5

Displacement limitation side B	
0+81	From 0 cm^3/rev to 81 cm^3/rev [4.940 in^3/rev]

S6CV 075 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

6

Version	
ME	ISO
SE	SAE

7

Mouting flange	
06	SAE-C 2/4 Bolts

Note:
For Tandem assembly check chapter “TANDEM COMBINATION DIMENSIONS”

8

Shaft end	
13	Splined 14T - 12/24 DP
AC	Splined 21T - 16/32 DP

9

Direction of rotation (viewed from shaft side)	
DX	CW
SX	CCW

10

Control	
HLR	Manual lever with feed-back
HIR	Hydraulic proportional with feed-back
HIN	Hydraulic proportional without feed-back
HER	Electric proportional with feed-back
HEN	Electric proportional without feed-back
HE2	Electric on-off
HEH	Electric proportional with emergency hydraulic override
HFD	Electric fan drive control
HME	Electric Automotive
HMI	Hydraulic Automotive

S6CV 075 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

11

Control features				Control									
				HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
IH	Inching		Hydraulic inching	–	–	–	–	–	–	–	_	●	●
IM			Mechanical inching	–	–	–	–	–	–	–	–	–	–
00			Without inching	–	–	–	–	–	–	–	–	●	●
12	Voltage	(V)	12 connector DIN 43650	–	–	–	●	–	●	●	–	●	–
24		(V)	24 connector DIN43650	–	–	–	●	–	●	●	–	●	–
D2		(V)	12 - Deutsch DT04	–	–	–	●	–	●	●	–	●	–
D4		(V)	24 - Deutsch DT04	–	–	–	●	–	●	●	–	●	–
N2		(V)	12 AMP JUNIOR	–	–	–	–	●	–	–	●	–	–
N4		(V)	24 AMP JUNIOR	–	–	–	–	●	–	–	●	–	–
00	Control orifices diameter [(1)]	mm [in]	Without control orifices	S	●	–	●	●	–	–	●	–	–
05		mm [in]	Ø 0.5 [Ø 0.019]	–	–	●	–	–	–	–	–	–	–
06		mm [in]	Ø 0.6 [Ø 0.024]	–	●	–	●	–	–	–	–	–	_
07		mm [in]	Ø 0.7 [Ø 0.027]	–	●	●	●	–	–	–	–	–	–
08		mm [in]	Ø 0.8 [Ø 0.031]	–	S	S	S	–	–	S	–	–	–
H8		mm [in]	Ø 0.8 [Ø 0.031]	–	●	–	–	–	–	–	–	–	–
09		mm [in]	Ø 0.9 [Ø 0.035]	–	●	●	–	–	–	–	–	–	–
10		mm [in]	Ø 1.0 [Ø 0.039]	–	●	–	–	–	–	–	–	–	–
12		mm [in]	Ø 1.2 [Ø 0.047]	–	●	–	–	–	S	–	–	S	S
15		mm [in]	Ø 1.5 [Ø 0.059]	–	–	–	–	–	–	–	–	●	●
20		mm [in]	Ø 2.0 [Ø 0.0787]	–	–	–	●	–	–	–	–	–	–
(*)	Starting speed	(rpm)		–	–	–	–	–	–	–	–	●	●
(*)	Maximum torque speed	(rpm)		–	–	–	–	–	–	–	–	●	●
(*)	Maximum torque value	(Nm)		–	–	–	–	–	–	–	–	●	●

(*) Supply the setting value.
• : Required
– : Not required
S: standard
[(1)] in case of the different response times, please you contact sales office

12

Charge pump		
00	Without charge pump	
18	Displacement 18 cm^3/rev [1.098 in^3/rev]	Standard
23	Displacement 23.1 cm^3/rev [1.41 in^3/rev]	
27	Displacement 27.3 cm^3/rev [1.647 in^3/rev]	

S6CV 075 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

13

Pressure relief valve side A		
25	250 bar [3625 psi]	
30	300 bar [4350 psi]	
35	350 bar [5075 psi]	
42	420 bar [6090 psi]	Standard

14

Pressure relief valve side B		
25	250 bar [3625 psi]	
30	300 bar [4350 psi]	
35	350 bar [5075 psi]	
42	420 bar [6090 psi]	Standard

15

Charge pressure relief valve			Control									
			HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
AE	20 bar a 1000 rpm [290 psi at 1000 rpm]		●	●	●	●	●	●	●	–	●	●
AF	22 bar a 1000 rpm [319 psi at 1000 rpm]	Standard	●	●	●	●	●	●	●	–	●	●
AG	25 bar a 1000 rpm [319 psi at 1000 rpm]		●	●	●	●	●	●	●	●	●	●

16

Pressure compensator and Cut-Off valves			Control									
			HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
XX	Without pressure compensator	Standard	–	–	–	–	●	–	–	●	●	●
PC	Pressure compensator		●	●	●	●	–	●	●	●	–	–
TE	Electric Cut-Off		●	●	●	●	–	●	●	–	–	–
EP	Electric Cut-Off + Pressure Compensator		●	●	●	●	–	●	●	–	–	–

17

Cut-Off valves feature			Cut-Off valves			
			XX	PC	TE	EP
000	Feature not necessary		●	–	–	–
000	Pressure setting (bar)	Locked	–	●	–	●
100÷400	Pressure setting (bar)	100÷400 bar (*)	–	●	–	●
12	Voltage	12 V	–	–	●	●
24	Voltage	24 V	–	–	●	●

• : Required
– : Not required
(*) Supply the setting value

S6CV 075 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

18

Filter			Control									
			HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
XX	Without Filter	Standard	•	•	•	•	•	•	•	•	•	•
M8	Optical clogging sensor (8 bar) [116 psi]		•	•	•	•	•	•	•	•	–	–
E9	Electric clogging sensor (8 bar) [116 psi]		•	•	•	•	•	•	•	•	–	–
E3	Electric clogging sensor (8 bar) [116 psi] + DIN 43650 connector		•	•	•	•	•	•	•	•	–	–
E2	Electric clogging sensor (8 bar) [116 psi] + DIN 43650 connector with LED 24V		•	•	•	•	•	•	•	•	–	–
E1	Electric clogging sensor (8 bar) [116 psi] + DIN 43650 connector with LED 12V		•	•	•	•	•	•	•	•	–	–
FR	Through drive remote filter		•	•	•	•	•	•	•	•	=	=

• : Available
– : Not available
= : Not available for HME/HMI + Cut-Off valve TE/TP

Note:
E9 feature as “Standard production” for electric clogging sensor

19

Through drive		
Through drive for 2ndPump assembled by the customer		
XX	Without through drive	Standard
SA	SAE A = Z9 - 16/32 DP	
SB	SAE B = Z13 - 16/32 DP	
BB	SAE B-B = Z15 - 16/32 DP	
SC	SAE C = Z14 - 12/24 DP	
CC	SAE C-C = Z17 - 12/24 DP	
G2	GR2 L = 4	
G3	GR3	
Through drive for 2nd pump assembled by Dana		
TA	Tandem through drive with flange SAE A = 9T - 16/32 DP	
TB	Tandem through drive with flange SAE B = 13T - 16/32 DP	
TZ (1)	Tandem through drive with flange SAE B-B = 15T - 16/32 DP (Special for S5AV 032/045/050/063 pumps)	
TY (2)	Tandem through drive with flange SAE B - DIN 5480 W35x2x30x16x9g (Special for S5AV 050/063 pumps)	
BT	Tandem through drive with flange SAE B-B = 15T - 16/32 DP	
TC	Tandem through drive with flange SAE C = 14T - 12/24 DP	
TX	Tandem through drive with flange SAE C = 21T - 16/32 DP	

(1) Tandem S6CV 75 + S5AV 032/045/050/063 with shaft Z15 16/32 DP
(2) Tandem S6CV 75 + S5AV 050/063 with shaft DIN 5480 W35x2x30x16x9g

S6CV 075 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

20

Flushing valve		Controls									
		HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
XX	Not request	●	●	●	●	●	●	●	●	●	●
PR	Arranged for Flushing Valve	–	–	–	–	–	–	–	–	●	●
06	6 l/min [1.58 U.S. gpm] Orifice Diameter Ø 1.5 [0.005]	–	–	–	–	–	–	–	–	●	●
09	10.5 l/min [2.77 U.S. gpm] Orifice Diameter Ø 2.0 [0.07]	–	–	–	–	–	–	–	–	●	●
15	15 l/min [3.96 U.S. gpm] Orifice Diameter Ø 2.5 [0.09]	–	–	–	–	–	–	–	–	●	●

• : Available
– : Not available

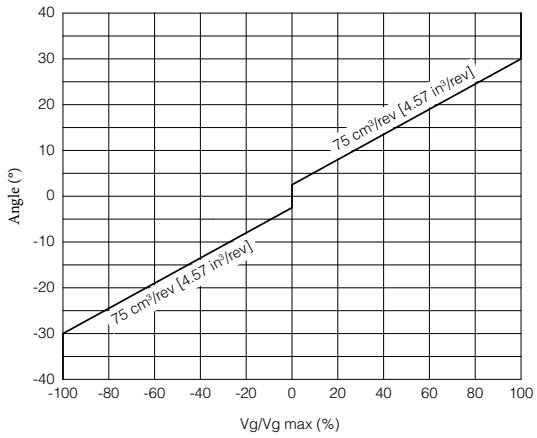
21

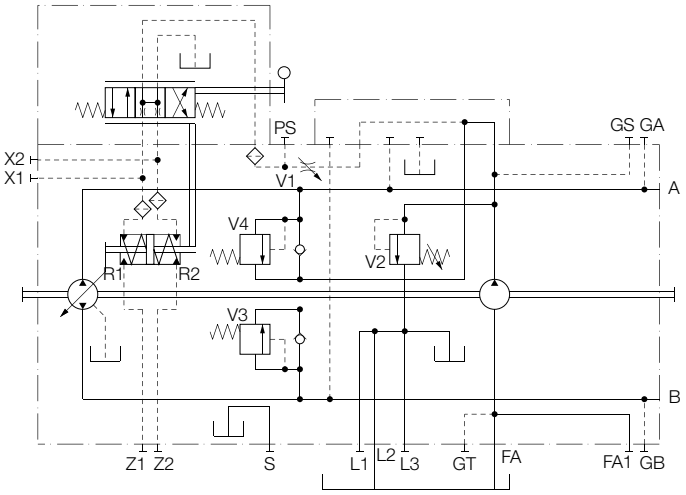
Pump Feature	
XXX	Not request
BPV	By Pass valve
DT4	Conversion cable from DIN43650/ISO4400 to Deutsch DT04 connector

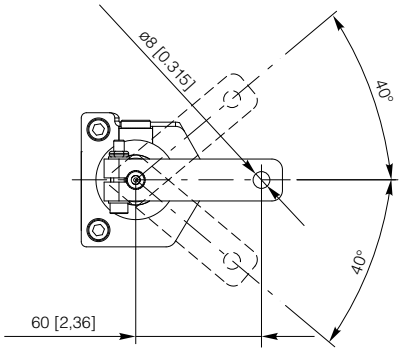
22

Painting	
XX	Not request
01	Black Painted RAL 9005

The displacement of the pump is directly proportional to the angle of rotation of the lever. The feedback system feels the position of the swashplate and works automatically to compensate for a positioning error. The diagram below shows the ralationship between angle and displacement.





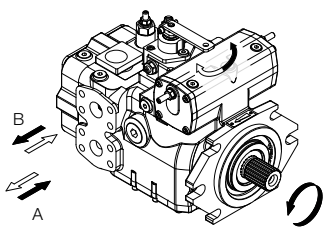


The torque necessary at the control lever is between 1 and 2.45 Nm [0.737 and 1.80 lbf·ft].

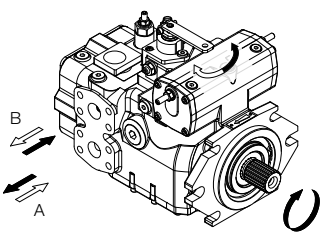
Note:
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

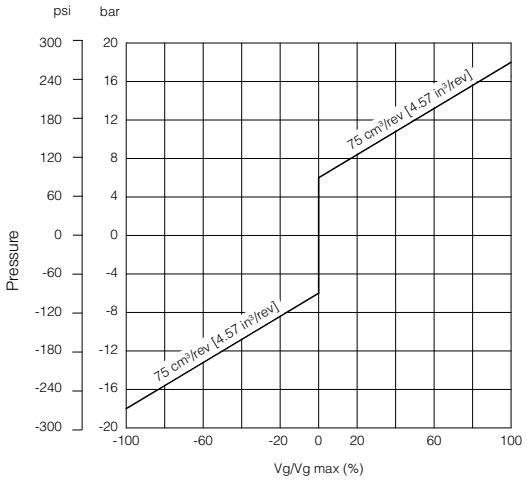
HLR (CCW)

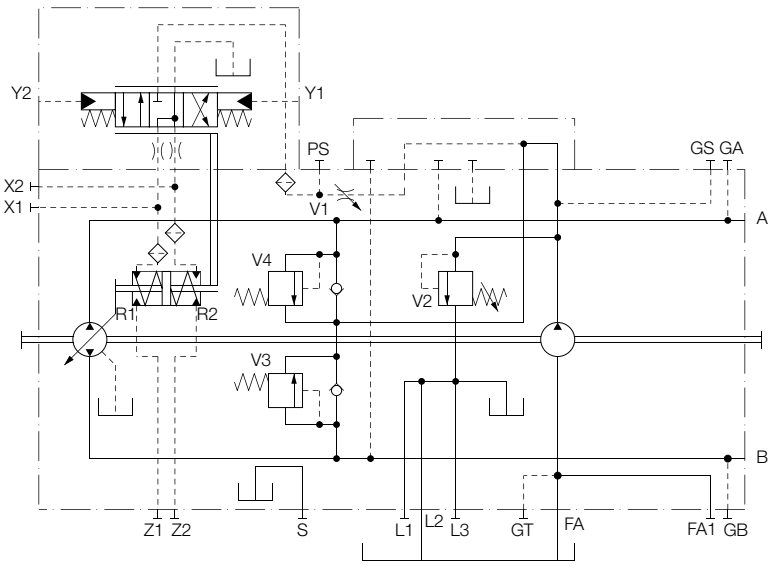


HLR (CW)



The pump displacement is proportional to the pilot pressure on Y1 or Y2 ports, which also affect flow direction. The feedback system feels the position of the swashplate and works automatically to compensate for a positioning error. Piloting can be provided by boost pressure from GS port. The piloting pressure will then have to be controlled by a joystick or by a pressure reducing valve (not supplied).





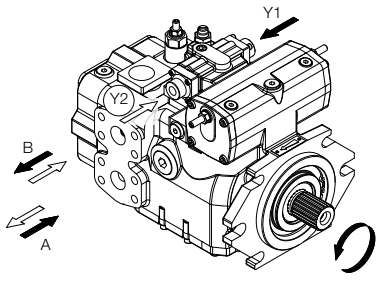
Pilot pressure = 6÷18 bar [87÷261 psi] (at ports Y1, Y2)
Start of control = 6 bar [87 psi]
End of control = 18 bar [261 psi] (Max displacement)

Note:
The tolerance on piloting pressure is ± 10% of maximum value.

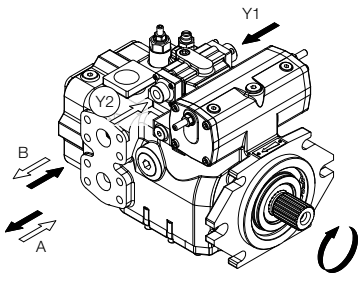
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

HIR (CCW)



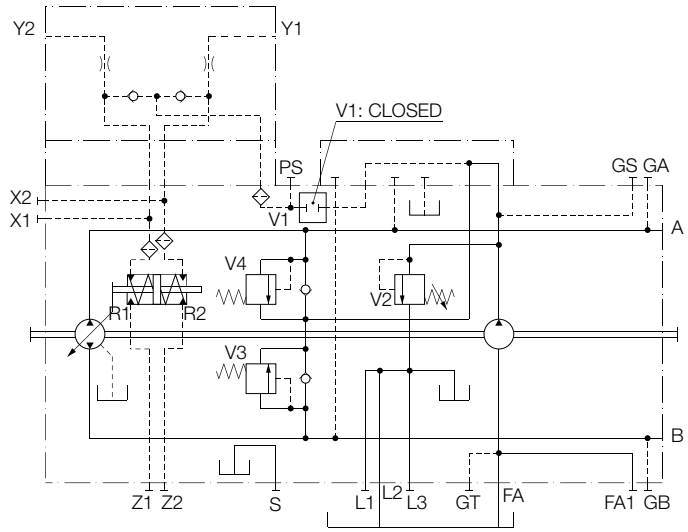
HIR (CW)



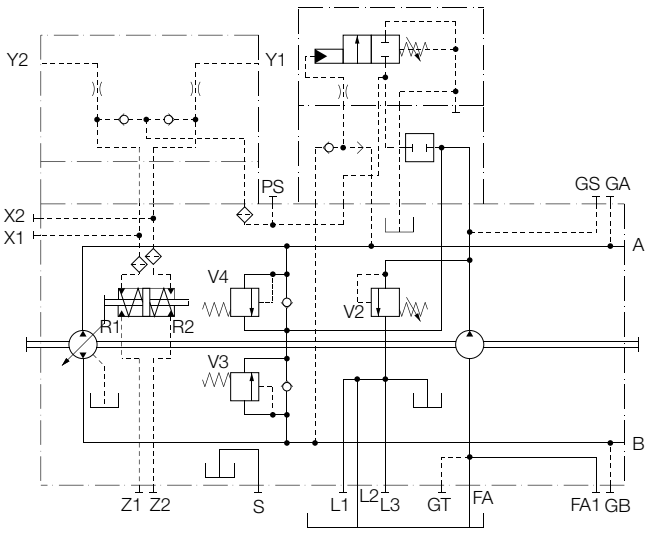
The pump displacement is proportional to the pilot pressure on Y1 or Y2 piloting ports, which also affect flow direction. The flow is also influenced by the working pressure and by the rotation speed of the pump. With a given input signal (piloting pressure) the pump can vary the displacement and the flow when working pressure or rotating speed change. Feeding pressure to the control joystick can be provided by charge pressure from GS port. The piloting pressure must then be controlled by said joystick or by a pressure reducing valve (not supplied). The orifice dimensions must be choosed in function of the response time required, see the table below.

Warning:
HIN control could require working parameters review. Please contact Dana technical service

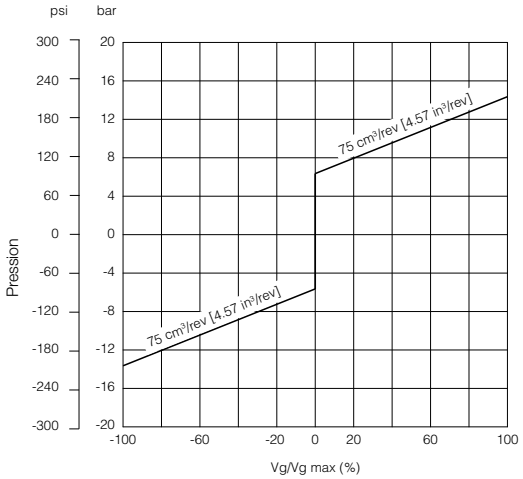
HIN



HIN with cut-off valves



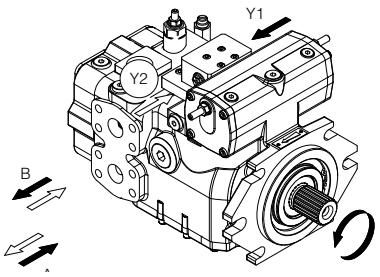
Pilot pressure = 6÷14 bar [87÷ 203 psi] (at ports Y1, Y2)
Maximum Pilot pressure = 30 bar [435 psi]
Start of control = 6 bar [87 psi]
End of control = 14 bar [203 psi](Max displacement)



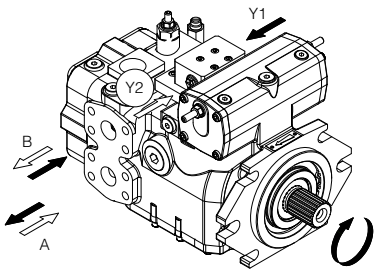
Note:
The tolerance on piloting pressure is ± 10% of maximum value.

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

HIN (CCW)

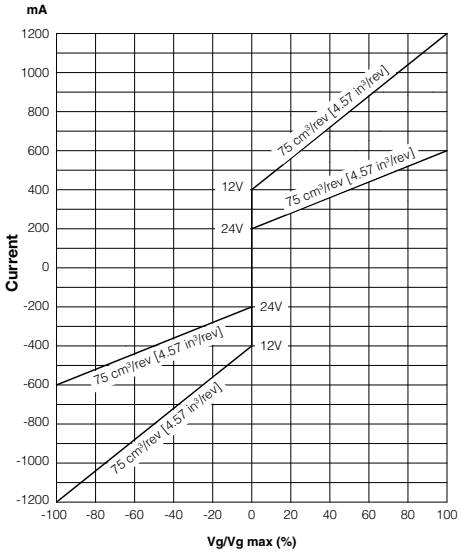


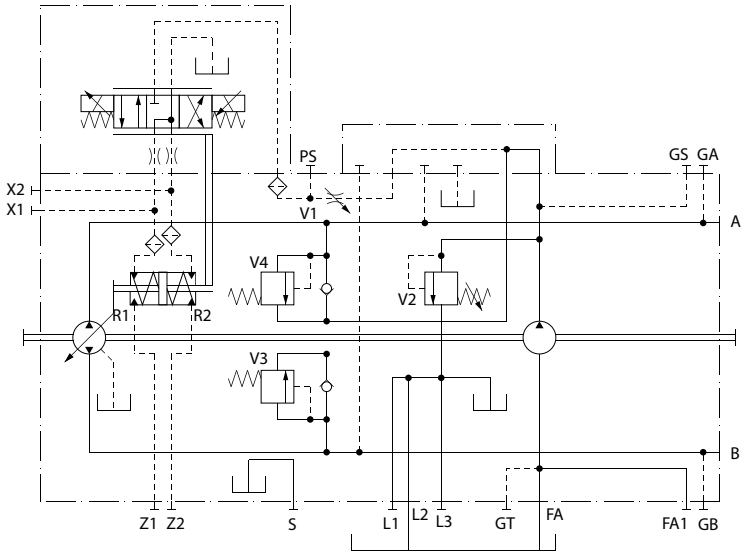
HIN (CW)



S6CV 075 - Electric proportional control with feed-back

The displacement of the pump is directly proportional to the input current of one of the two proportional solenoids. The feedback system feels the position of the swashplate and works automatically to compensate for a positioning error. The input current of the two proportional solenoids must be controlled by an external amplifier card and it is recommended to use our amplifier specific for S6CV. Flow direction depends on which solenoid is energized. Standard solenoids are proportional at 24V d.c. max. current 1A. (Optional solenoids 12V d.c. max. current 2A).
For emergency operation only it is however possible to control solenoids directly with 24V d.c.voltage (or 12V d.c.), by-passing the amplifier.





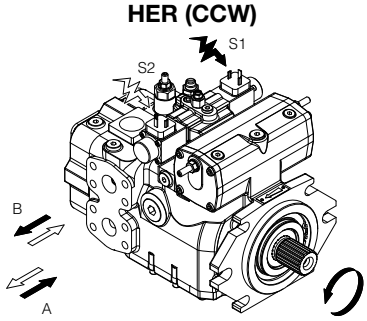
Solenoid 24V:
Current min. 200 mA max 600 mA
Solenoid 12V:
Current min. 400 mA max 1200 mA

Note:
The tolerance on piloting current is ± 10% of maximum value.

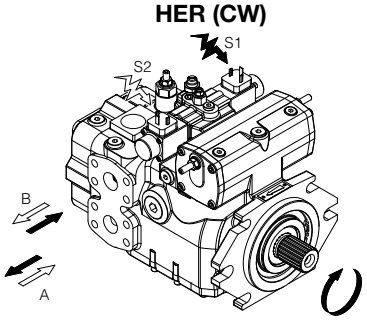
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

HER (CCW)

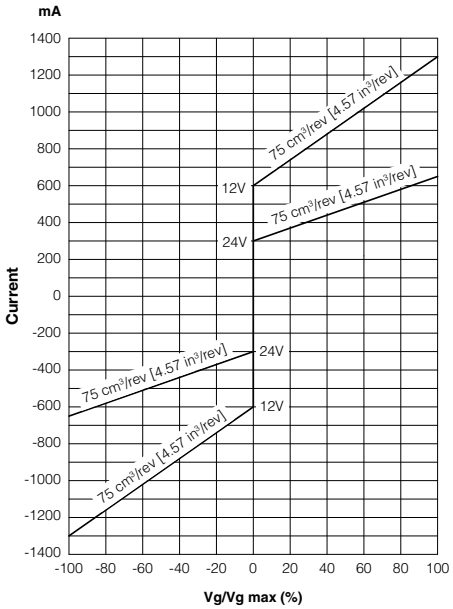


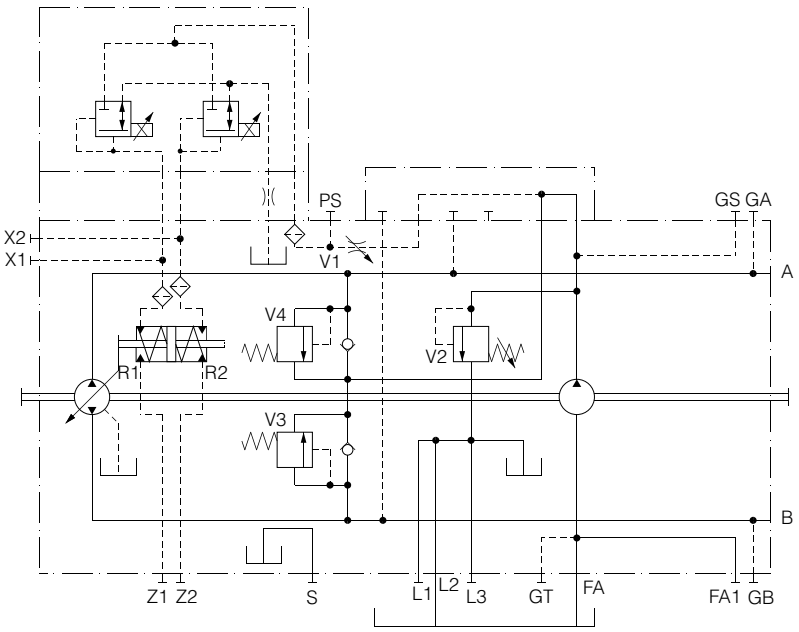
HER (CW)



The displacement of the pump is directly proportional to the input current of one of the two proportional solenoids. The flow is also influenced by the working pressure and by the rotation speed of the pump. With a given input signal (piloting current) the pump can vary the displacement and the flow when working pressure or rotating speed change. The input current of the two proportional solenoids must be controlled by an external amplifier card and it is recommended to use our amplifier specific for S6CV. Flow direction depends on which solenoid is energized. Standard solenoids are proportional 24V d.c. max. current 1A. (Optional solenoids 12V d.c. max. current 2A). For emergency operation only it is however possible to control solenoids directly with 24V d.c.voltage (or 12V d.c.), by-passing the amplifier.

Warning:
HEN control could require working parameters review. Please contact Dana technical service



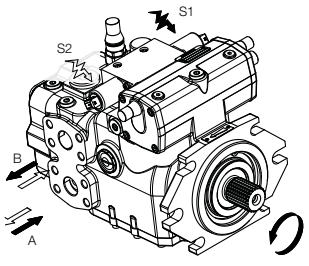


Solenoid 24V:
Current min. 300 mA max 650 mA
Solenoid 12V:
Current min. 600 mA max 1300 mA

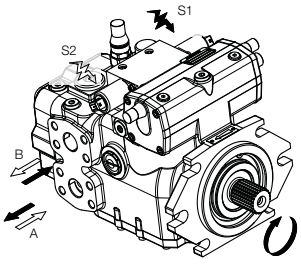
Note:
The tolerance on piloting current is ± 10% of maximum value.

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

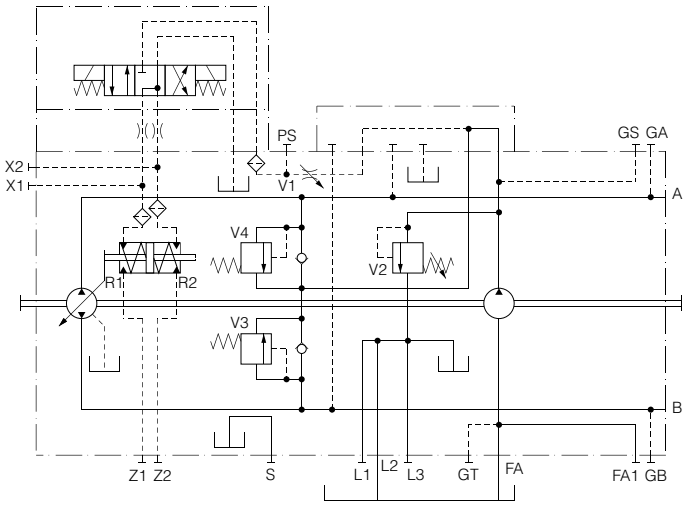
HEN (CCW)



HEN (CW)

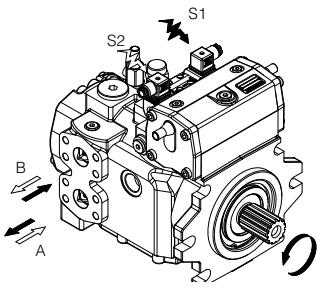


By switching on one of the solenoids the pump swivels to maximum displacement in the corresponding output flow direction.
Switching off the stated solenoid will result in swivelling back the pump to zero displacement position.

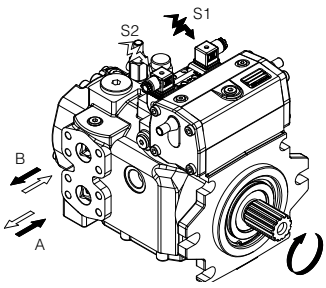


Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

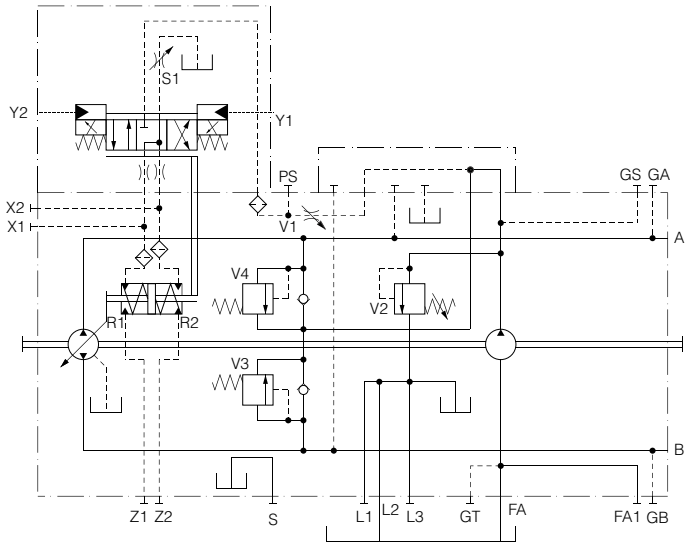
HE2 (CCW)



HE2 (CW)



This control has the same electric proportional features of HER control, but it also has an emergency hydraulic proportional control capability when a pilot pressure on Y1 and Y2 ports. The input current of the two proportional solenoids must be controlled by an external amplifier card and it is recommended to use our amplifier specific for S6CV. Hydraulic operation of HEH control is meant to be an emergency device to control displacement of the pump in case of a breakdown of the electric circuit. A pilot pressure of 22 bar [319 psi] is required to swivel the pump to max displacement in emergency operation.

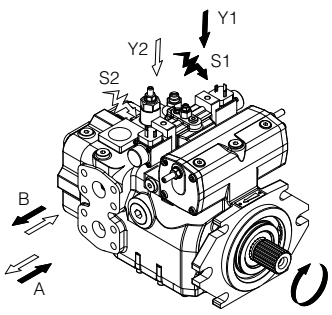


Warning:
Y1 and Y2 ports must not have any back pressure durino normal electric control operation (vented to tank).

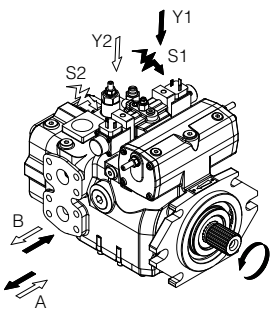
Note:
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

HEH (CCW)

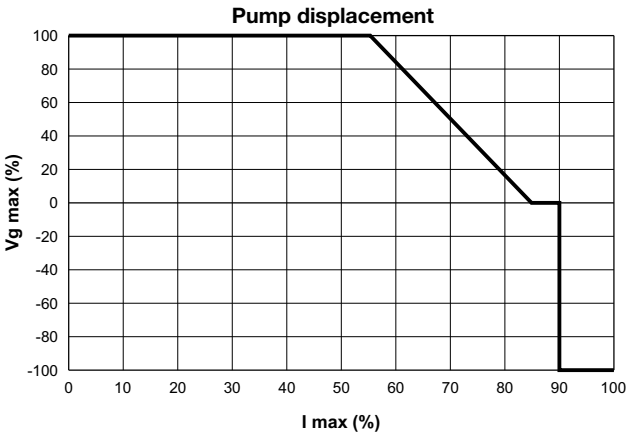


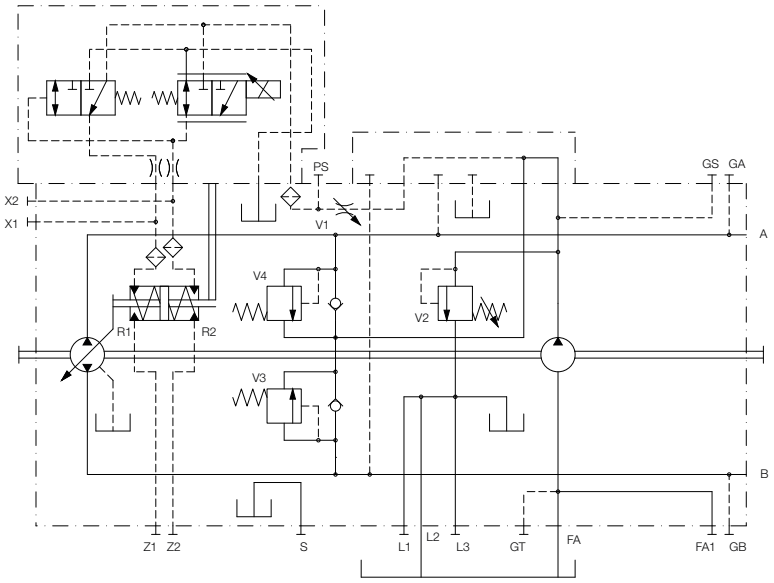
HEH (CW)



S6CV 075 - Electric fan drive control HFD

Fan drive control (HFD) is a non-feedback control electrically operated.
Pump displacement is directly proportional to the input current on the proportional solenoid. Flow is also influenced by working pressure and rotation speed, with a given input signal pump can vary displacement and flow due to working pressure and speed rotation variation.
Input current must be control by an external amplifier.
Flow direction depends on pump direction of rotation and on input current (see below diagram).



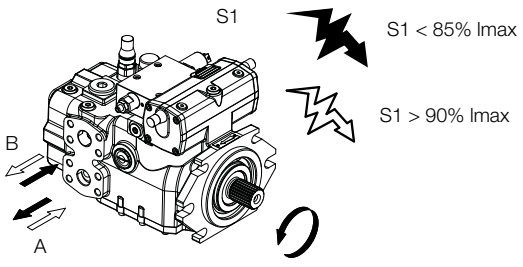


Voltage	I max	Protection	Resistance	Connector
12 VDC	1.5 A	DIN VDE 0470 / EN 60 529 -IP65	3.85 Ohm	AMP Junior Timer
24 VDC	0.75 A		15.15 Ohm	

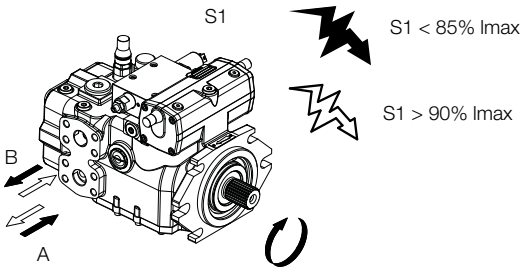
Minimum boost pressure 25 bar - 363 PSI.

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.
Flow direction depending to the I max current value.

HFD (CCW)



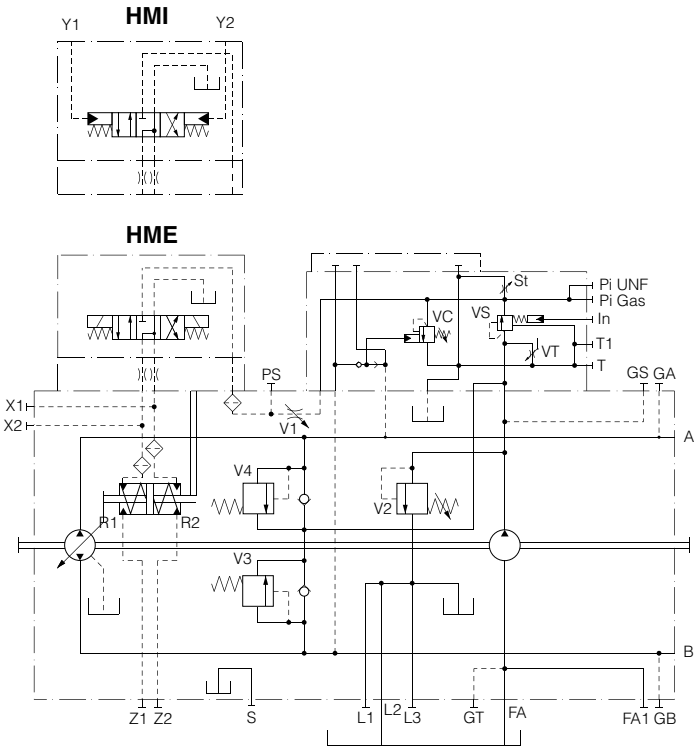
HFD (CW)



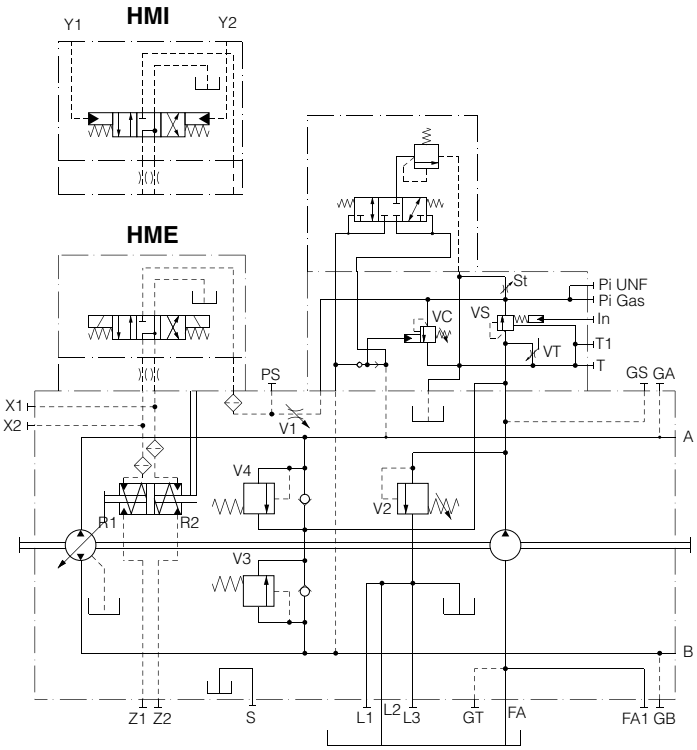
The “AUTOMOTIVE” (speed related) control, is used in hydrostatic transmissions with closed loop variable displacement pumps. This kind of controls allows to:
- Control of the vehicle translation speed;
- Limit the amount of Torque required from the Engine;
- Inching of the vehicle speed. The control of the Inching valve can be done with an hydraulic signal (Minimum 12 bar [174 psi] is required to swivel the pump to null displacement) or with a lever.
- Possibility to control the direction of flow electrically (HME) and hydraulically (HMI).

To allows an oil cooling action, when operating at high speed and power, it is possible to mount a flushing valve.

Electric (HME) / hydraulic (HMI) automotive with hydraulic Inching (IH)

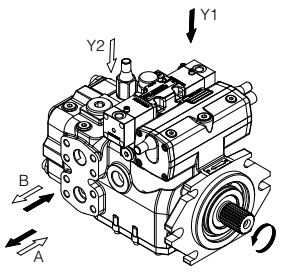


Electric (HME) / hydraulic (HMI) automotive with hydraulic Inching (IH) + Flushing valve

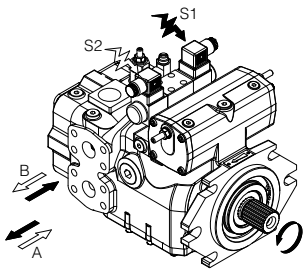


Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

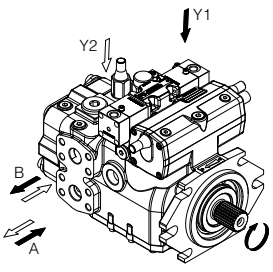
HMI (CCW)



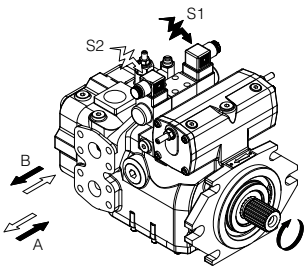
HME (CCW)



HMI (CW)



HME (CW)

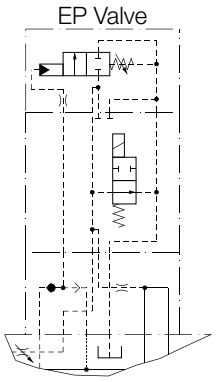


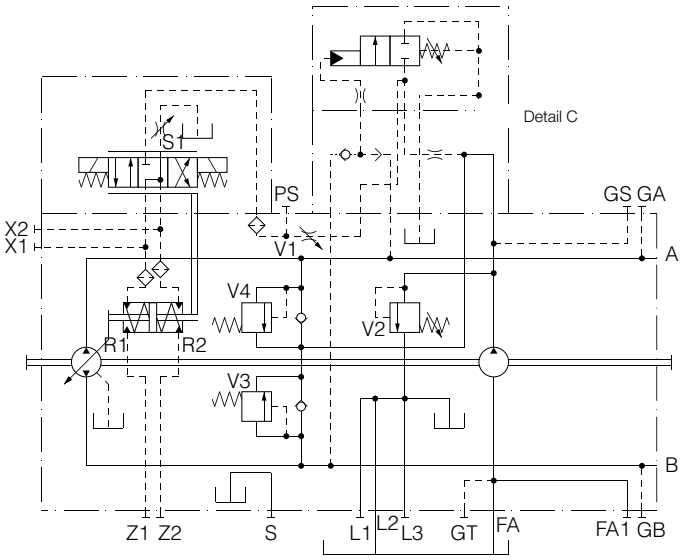
16 Pressure compensator and Cut-Off valve

PC Pressure compensator valve

The pressure compensator valve is meant to avoid opening of the relief valves: whenever working pressure reaches the PC valve setting, the swashplate is swivelled back reducing flow. The valve allows to maintain a costant pressure in the circuit at the setting value. It is advisable to fit the cut-off valve to all system where pressure peaks close to the relief valves setting value occur or in hydraulic systems engineered to the maximum pump pressure. It is recommended to set the pressure cut-off valve at 30 bar [435 psi] lower than the high pressure relief valve setting. Setting range:100÷400 bar [1450÷5800 psi].

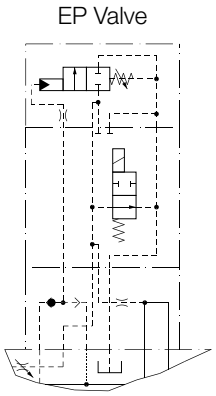
Note:
The pressure compensator valve is standard on HD1 pump and it can be combined with TE (EP) valve.

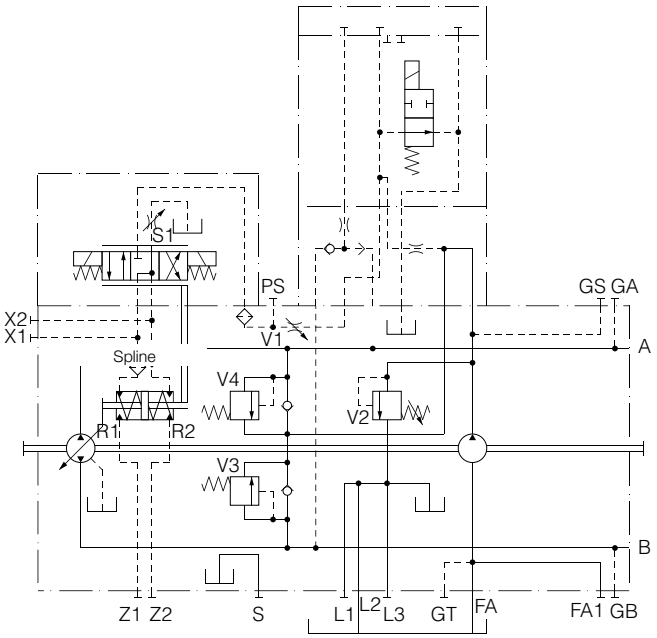




TE Electric Cut-Off valve

The electric cut-off valve, directly flangeable on S6CV pump housing, swivels back to zero the pump flow when power supply to the ON/OFF solenoid is cut-off. This valve has been designed for applications subject to safety rules, which required stopping of the machine in case of no electric signal. Feed voltage is 24V d.c. (optional 12V d.c.).

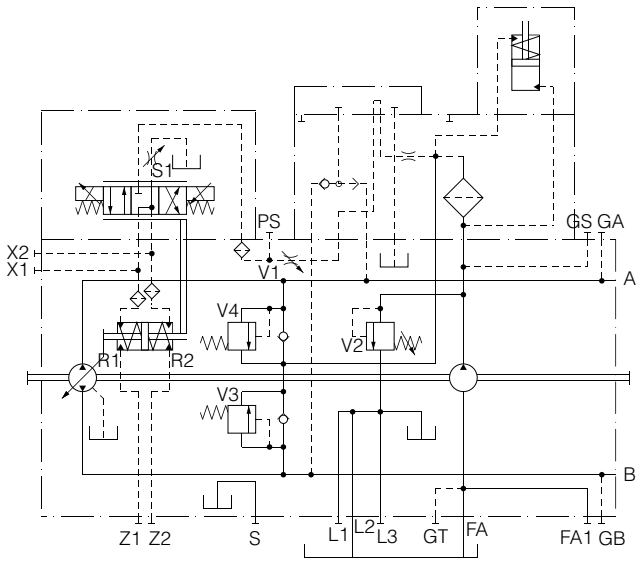




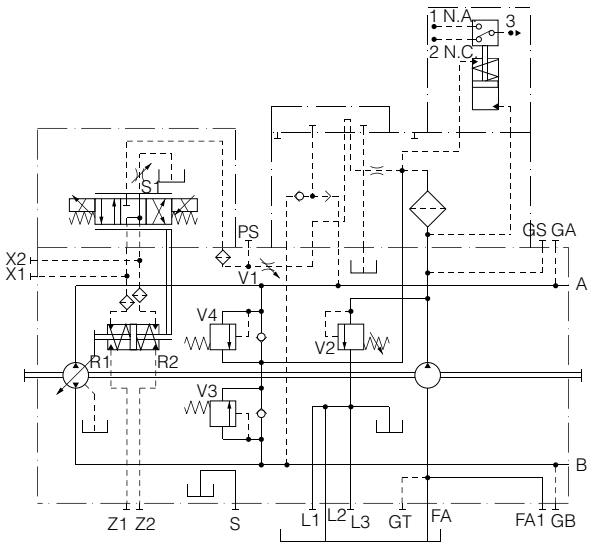
18 Filter

In order to guarantee an optimum fluid contamination level in the closed loop the S6CV can be equipped with a filter positioned on the delivery outlet of the charge pump. Only the flow necessary to reintegrate the lost oil due to leakage will pass through the filter, all the excess flow is not filtered and discharged through the pump drain line. In this way a longer life of the filter is achieved. The filter contains a composite fibre filtering element, with capacity of 12 micron absolute. The system uses sensors of clogging differential pressure of 8 bar [116 psi]) in optical and electrical (Connector DIN43650/ISO4400) version.
It is available a conversion cable from DIN43650/ISO4400 to Deutsch DT04 connector. The filter is without by-pass.
It is available a Remote Filter version for filtering in filter pressure not mounted on the pump.
It's possible to combine the filter with both cut-off valves.

M8 Optical sensor

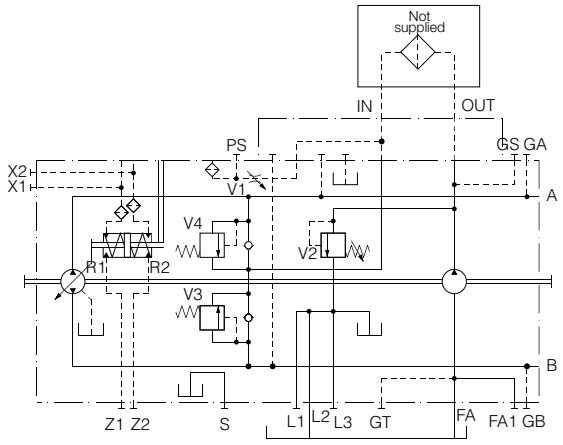


E1 - E2 - E3 - E9 Electrical sensor

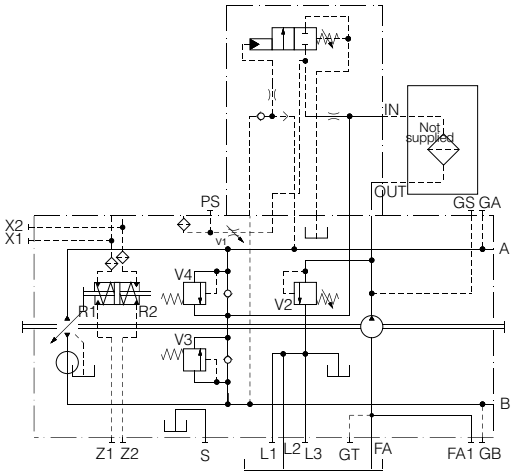


Share contact SPDT	Max. resistive load	Max. inductive load
C.A./A.C. 125-250 V	1 A	1 A
C.C./D.C. 30V	2 A	2 A
C.C./D.C. 50V	0.5 A	0.5 A
C.C./D.C. 75V	0.25 A	0.25 A
C.C./D.C. 125V	0.20 A	0.03 A

FR Remote filter



FP Remote filter + Cut-Off valve (FR+PC = FP)

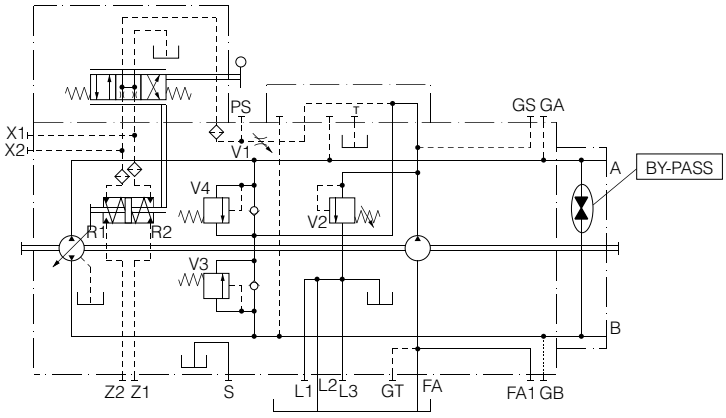


S6CV 075 - By-Pass valve

21 Pump feature

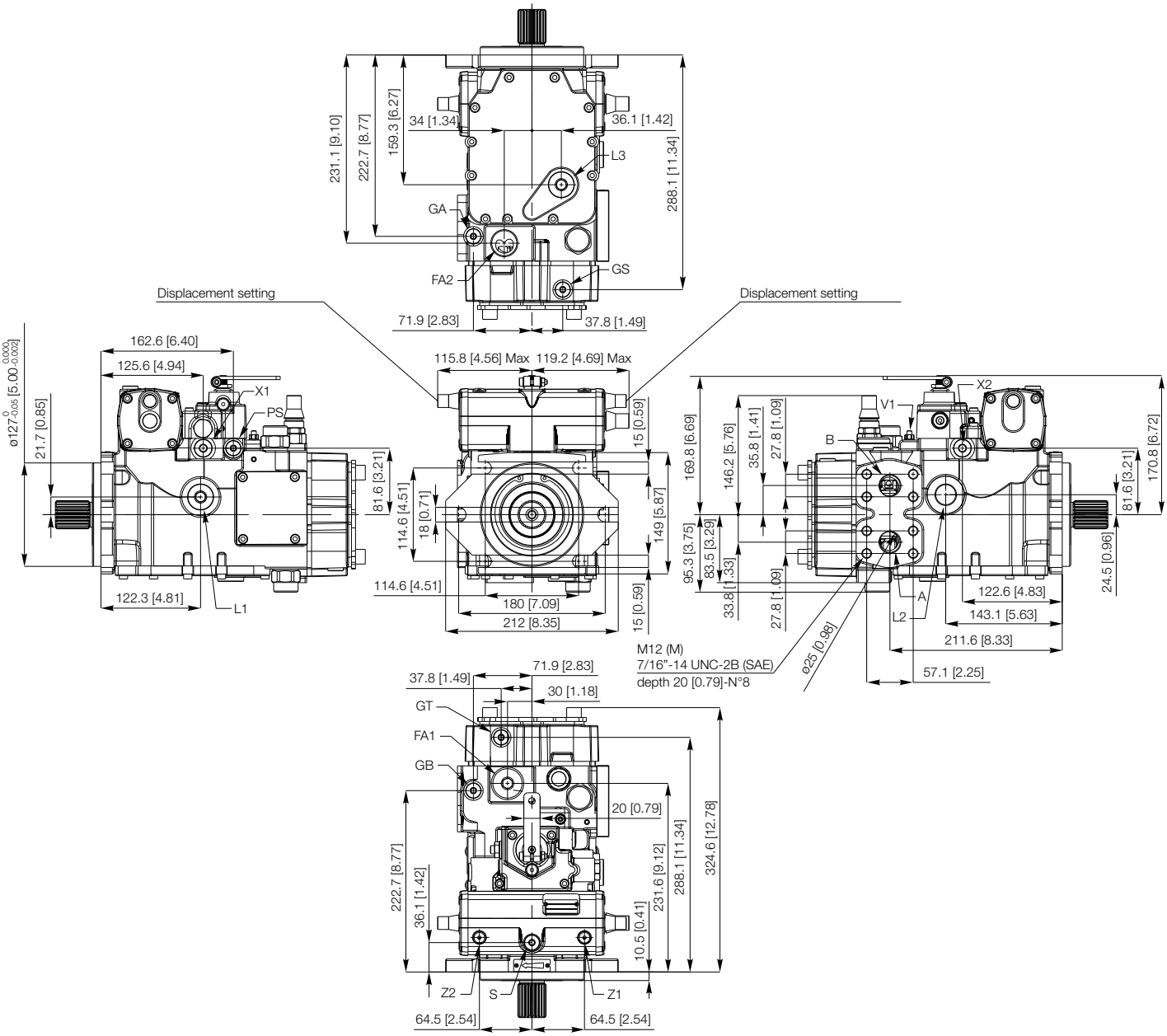
BPV By-Pass valve

The By-pass valve allows, if necessary, to connect the pressure port line A and B.
To open the valve unlock the locking nut and turn the screw 6 turns counter-clockwise



10 Control

HLR

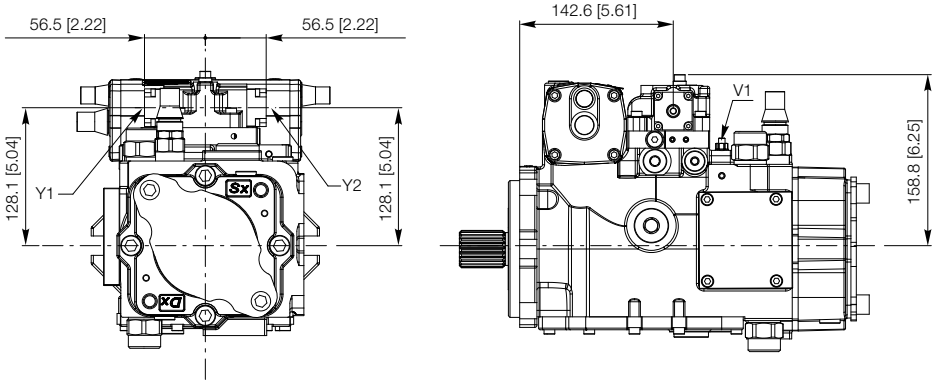


	Ports	ISO	SAE
A-B	Pressure ports	1" SAE 6000 psi	
L1-L2-L3	Case drain ports	3/4" G (BSPP) Depth 15	1-1/16"-12UN-2B Depth 15
FA1-FA2	Boost pump suction port	1" G (BSPP) Depth 21	1-5/16"-12UN-2B Depth 24
GA-GB	Pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
GS	Boost pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
PS	Control pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
X1-X2	Gauge port stroking chamber	3/8" G (BSPP) Depth 13	
S	Bleed port	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
Z1-Z2	Control pressure gauge	1/8" G (BSPP) Depth 10	7/16"-20UNF-2B Depth 16
GT	Boost inlet pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Prof.16
V1	Adjustable throttle valve		

S6CV 075 - Pump and controls dimensions

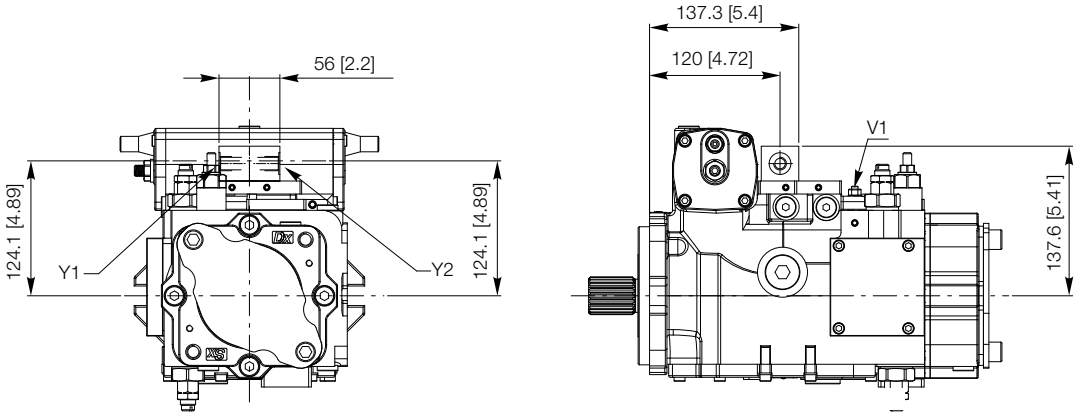
10 Control

HIR



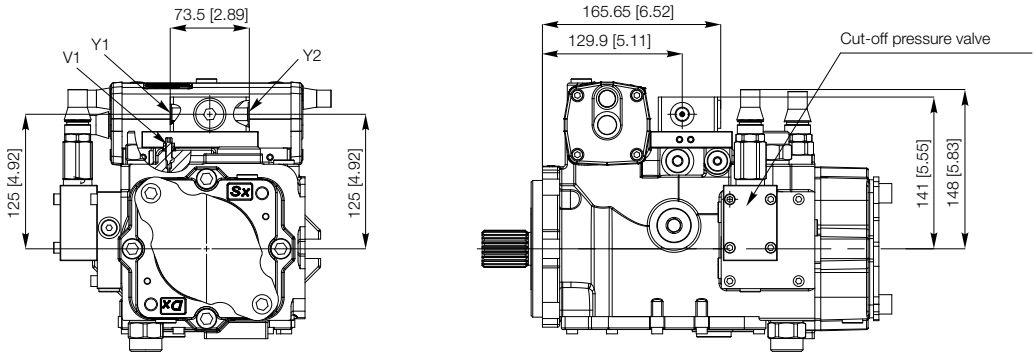
Y1, Y2: Control piloting pressure ports -1/4” G (BSPP) (ISO) - 7/16” - 20 UNF 2B (SAE)
V1: Adjustable throttle valve

HIN



Y1, Y2: Control piloting pressure ports -1/4” G (BSPP) (ISO) - 7/16” - 20 UNF 2B (SAE)
V1: Adjustable throttle valve

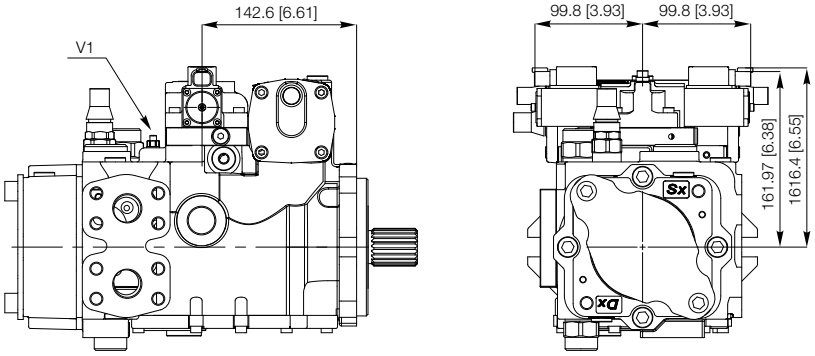
HIN with Cut-Off valve



Y1, Y2: Control piloting pressure ports -1/4” G (BSPP) (ISO) - 7/16” - 20 UNF 2B (SAE)
V1: Adjustable throttle valve

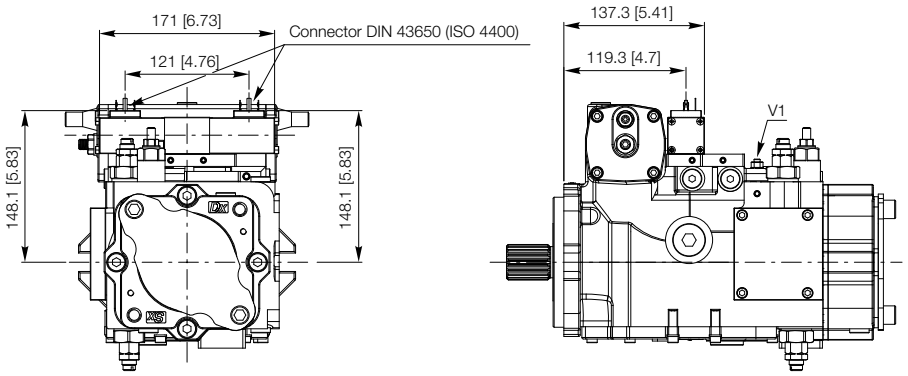
10 Control

HER



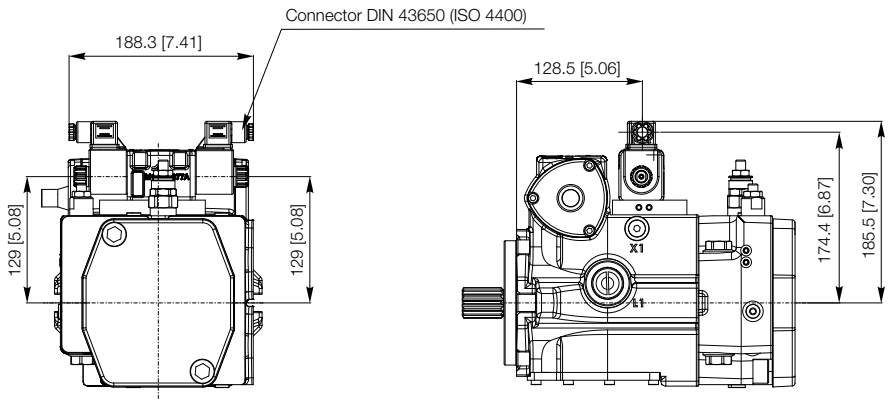
V1: Adjustable throttle valve

HEN



V1: Adjustable throttle valve

HE2

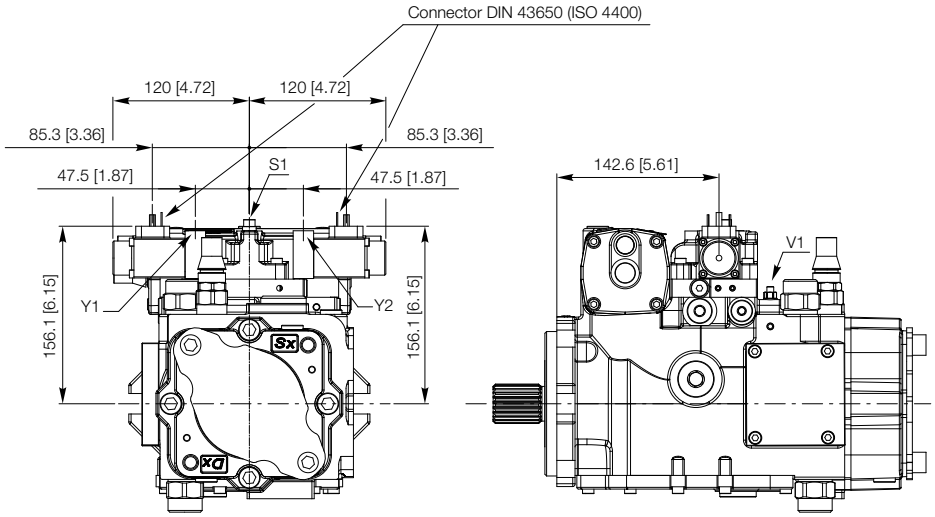


V1: Adjustable throttle valve

S6CV 075 - Pump and controls dimensions

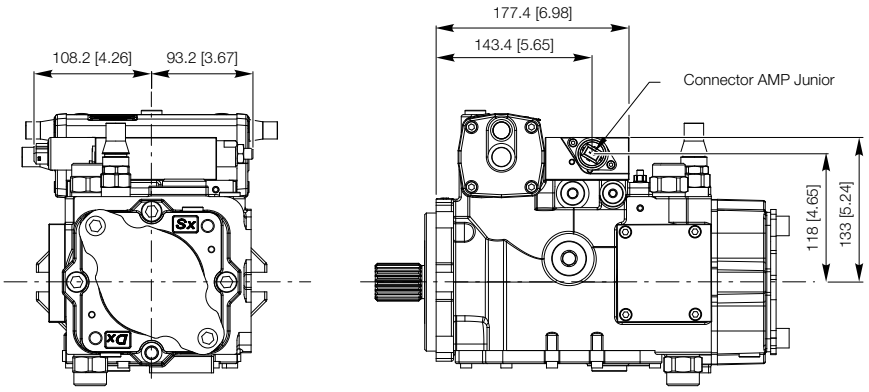
10 Control

HEH



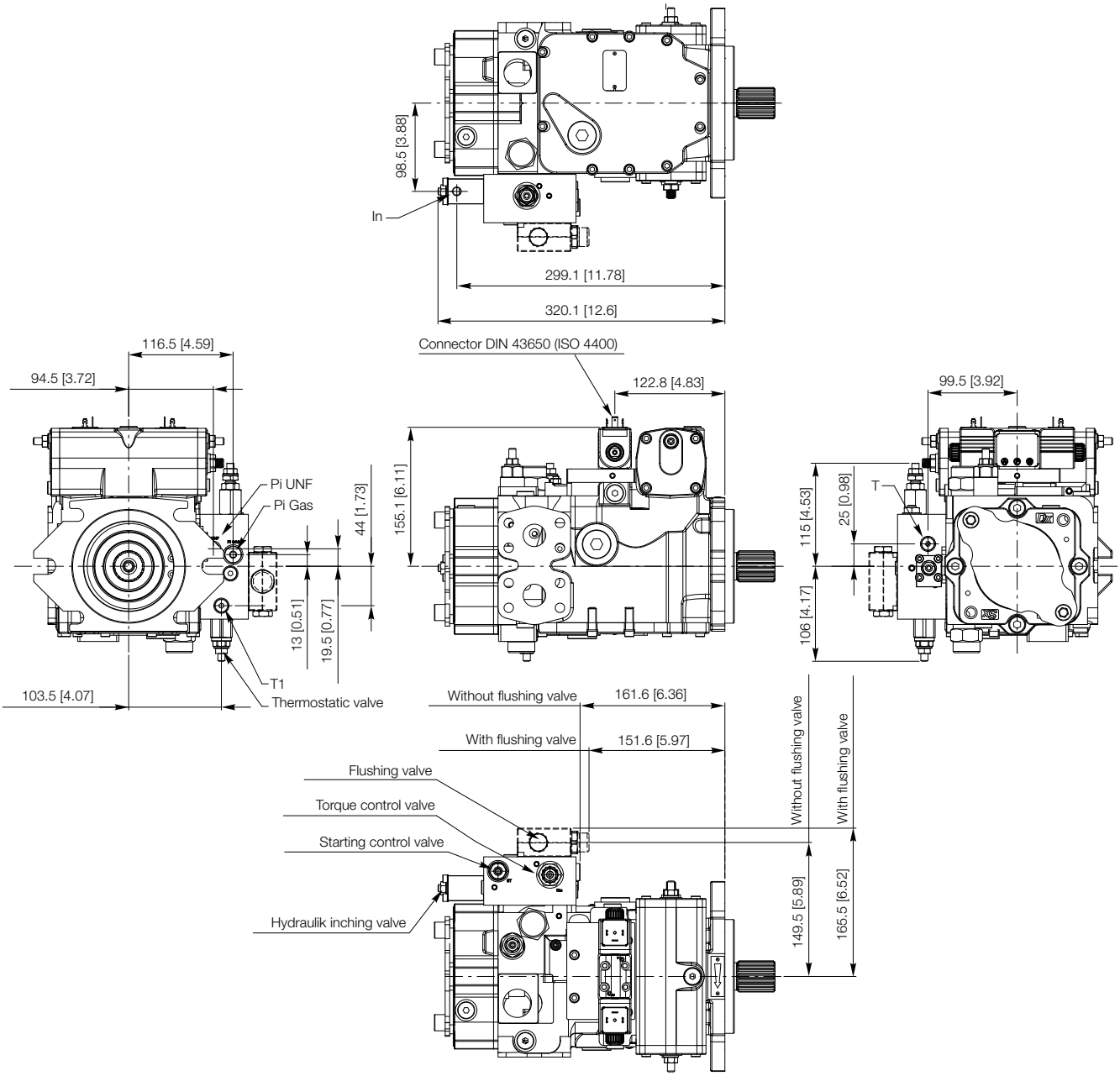
Y1, Y2: Control piloting pressure ports -1/8” G (BSPP) (ISO) - 5/16” - 24 UNF (SAE)
V1: Adjustable throttle valve

HFD



10 Control

Automotive HME with hydraulic Inching (IH)

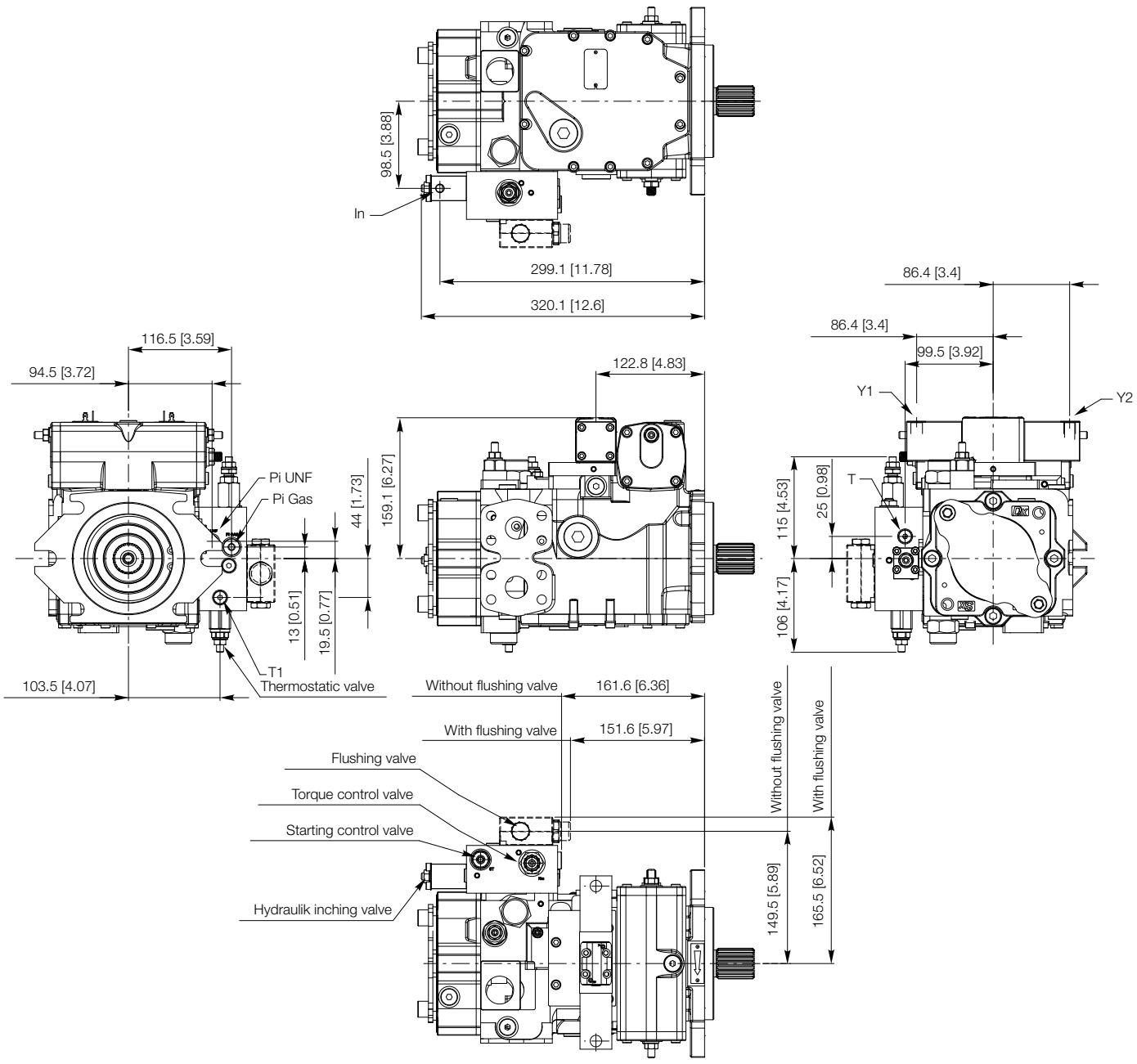


Pi Gas: Piloting pressure gauge port - 1/4 G (BSPP) (ISO)
Pi UNF: Piloting pressure gauge port - 7/16" - 20 UNF (SAE)
In: Piloting pressure Inching port - 1/8 G (BSPP) (ISO) - 7/16" - 20 UNF with Nipple (SAE)
T1: Drainage pressure gauge port - 1/8 G (BSPP)
T: Drainage pressure gauge port - 1/4 G (BSPP)

S6CV 075 - Pump and controls dimensions

10 Control

Automotive HMI with hydraulic Inching (IH)



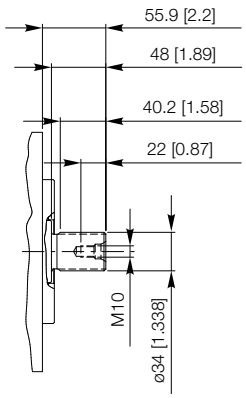
Y1-Y2: Control piloting pressure ports - 1/4” G (BSPP) (ISO) - 7/16” - 20 UNF with Nipple (SAE

Pi Gas: Piloting pressure gauge port - 1/4” G (BSPP) (ISO)
Pi UNF: Piloting pressure gauge port - 7/16” - 20 UNF (SAE)
In: Piloting pressure Inching port - 1/8” G (BSPP) (ISO) - 7/16” - 20 UNF with Nipple (SAE)
T1: Drainage pressure gauge port - 1/8” G (BSPP)
T: Drainage pressure gauge port - 1/4” G (BSPP)

10 Shaft end

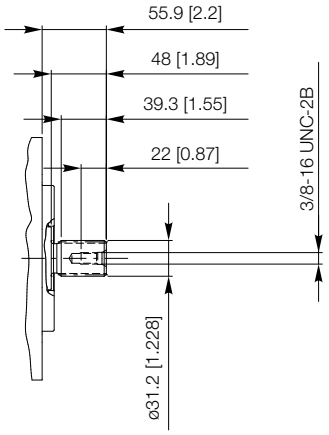
AC Splined shaft

SAE 1-3/8” 21T 16/32 - FLAT ROOT CLASS 5
ANSI B92.1a - 1976



13 Splined shaft

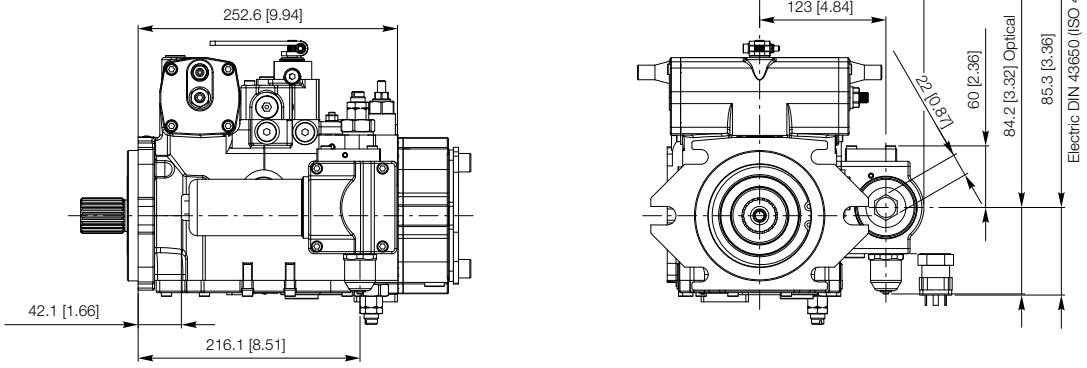
SAE 1-1/4” 14T 12/24 DP - FLAT ROOT CLASS 5
ANSI B92.1a - 1976



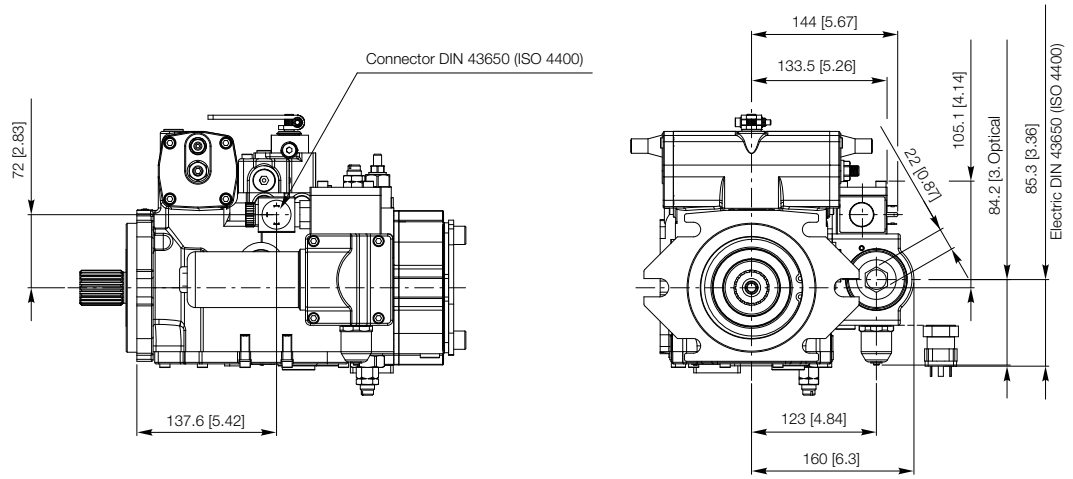
S6CV 075 - Pump and accessories dimensions

16 + 18 Pressure compensator and Cut-Off + Filter

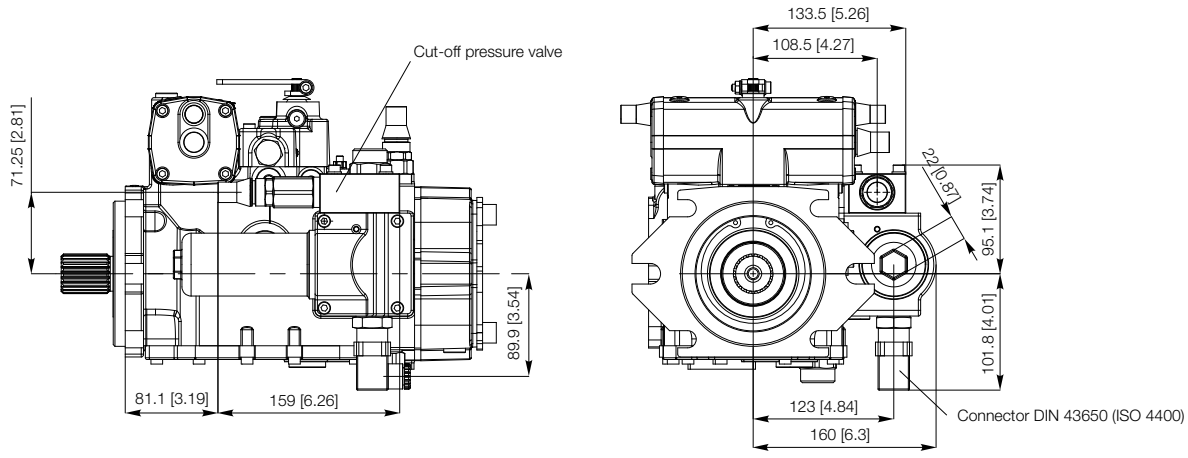
Filter



TE Filter + Electric Cut-Off valve

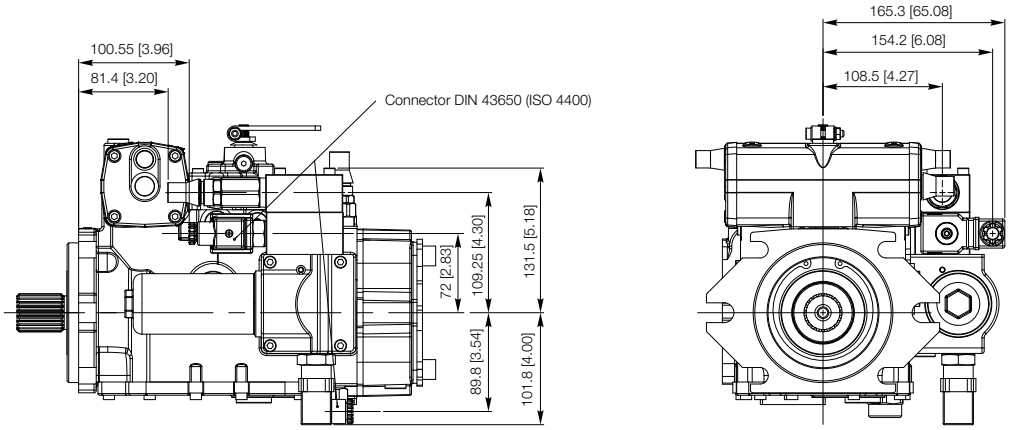


PC Filter + Pressure compensator

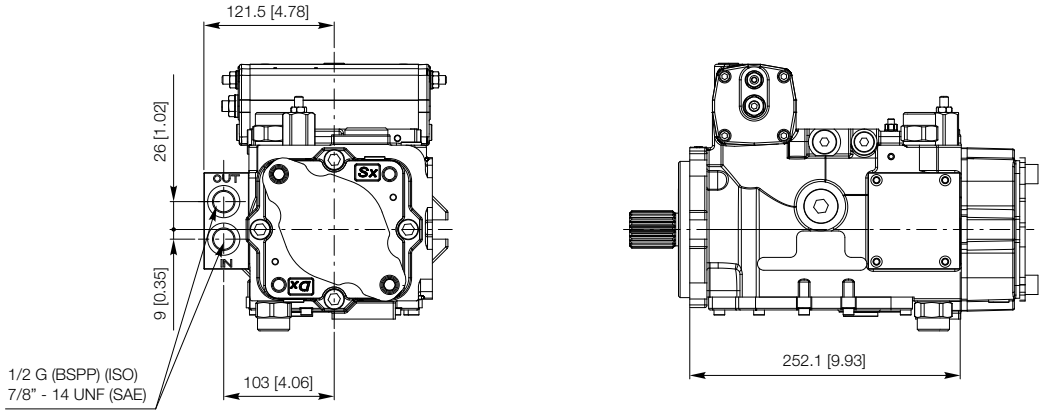


16 + 18 Pressure compensator and Cut-Off + Filter

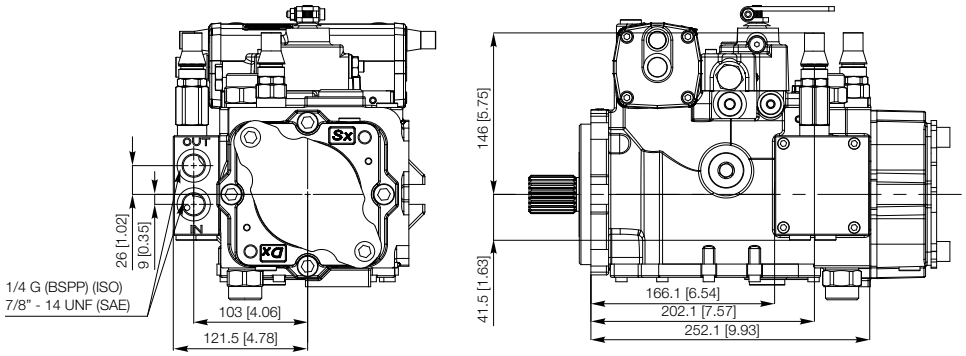
EP Filter + Electric Cut-Off valve + Pressure compensator



Remote filter



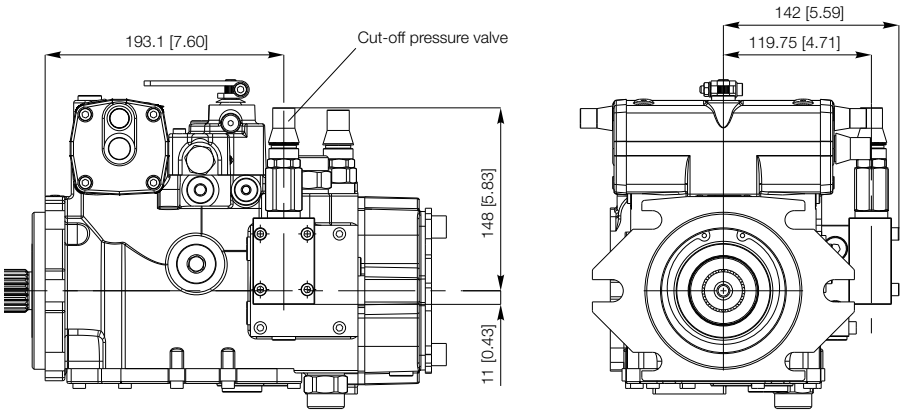
PC Remote filter + Pressure compensator



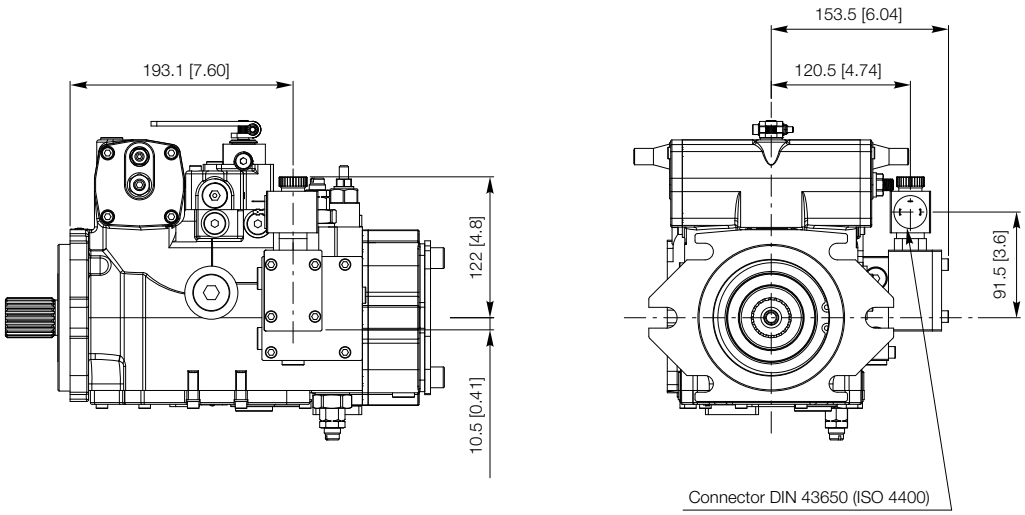
S6CV 075 - Pump and accessories dimensions

16 Pressure compensator and Cut-Off

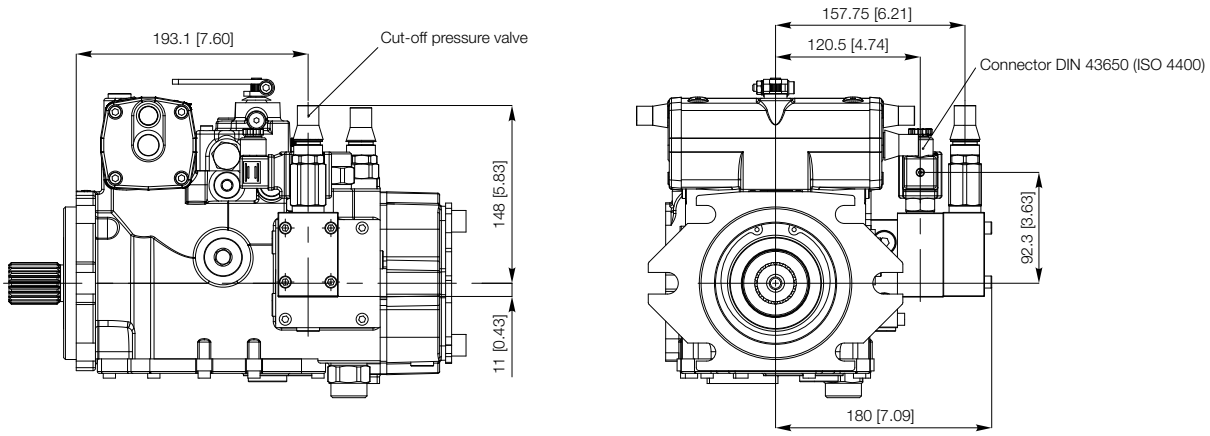
PC Pressure compensator



TE Electric Cut-Off valve

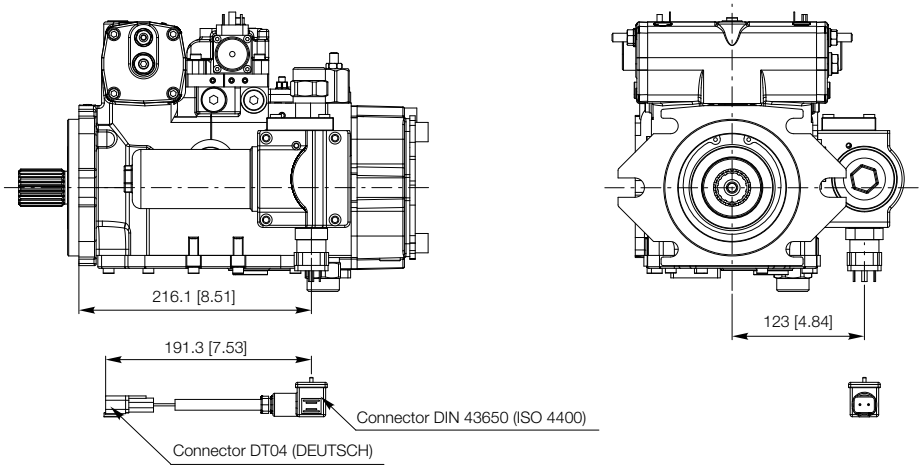


EP Electric Cut-Off + Pressure compensator

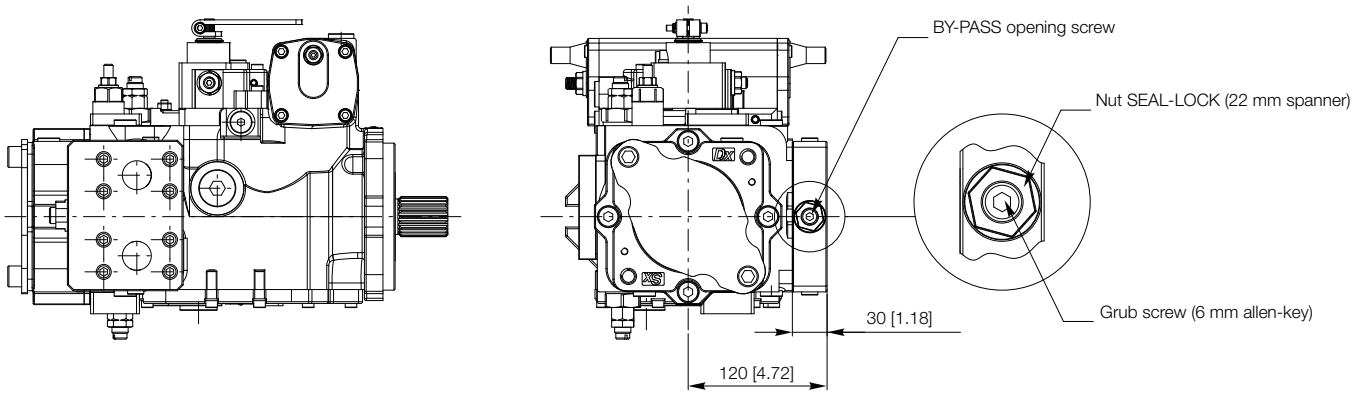


21 Pump feature

DT4 Conversion cable from DIN 43650/ISO 4400 to Deutsch DT04 connector (DET4)



BPV By - pass



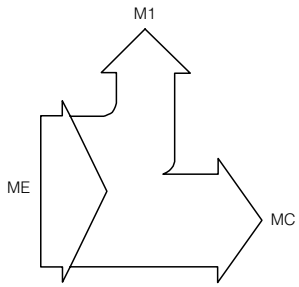
S6CV 075 - Throught drives

S6CV 75 pump can be supplied with through drive. The through drive can driving with a second S6CV 75 or a pump of other kind.

Available flanges are:
Standard G2 and G3 gear pump flange
SAE A, SAE B, SAE C, SAE B-B and SAE C-C flange
TANDEM flange

The maximum permissible torques on drive shaft of the first pump and the maximum through drive torques are listed in the table below.

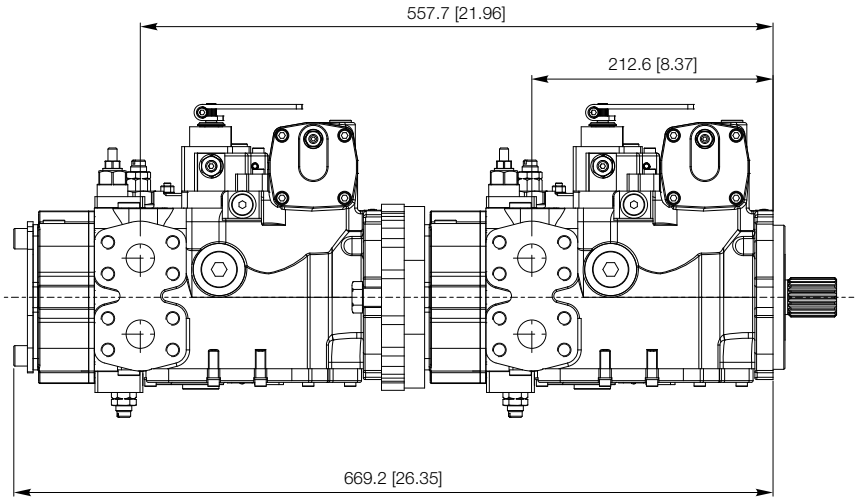
WARNING:
The effective torque value on the shaft of first pump is given by the sum of the torques required from each pump making the system.



Drive shaft			AC (Z21 16/32 DP)	13 (Z14 12/24 DP)
Drive shaft max torque	ME	Nm [lbf·ft]	950 [700]	620 [457]
Through drive max torque	MC	Nm [lbf·ft]	665 [490]	620 [457]

19 Throught drive

S6CV 075 + S6CV 075 Tandem



Shafts for combination pumps

	Configuration 075/075	
Pump	1st.	2nd.
Shafts	AC	AC
Shafts	AC	13
Shafts	13	13

Warning:
The TA-TB-BT-TC-TX-TZ-TY through drives must be used in the configuration of the first pump in the following cases:

1. Tandem pump combination.
2. Single pump for possible Tandem pump combination with Dana second pump.

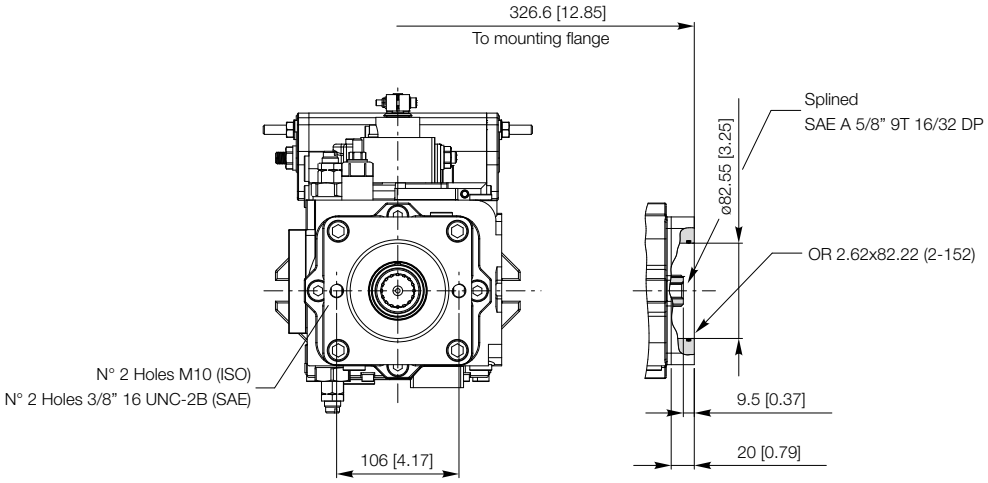
Example:

- If it is needed to purchase a Tandem pump combination with two S6CV 75 pumps and the second pump has the AC (21T - 16/32 DP) shaft, the first pump will must have the TX through drive.
- If it is needed to purchase a single S6CV 75 pump for Tandem pump combination with a S6CV 75 second pump with 13 (14T - 12/24 DP shaft, the pump will must have the TC through drive.

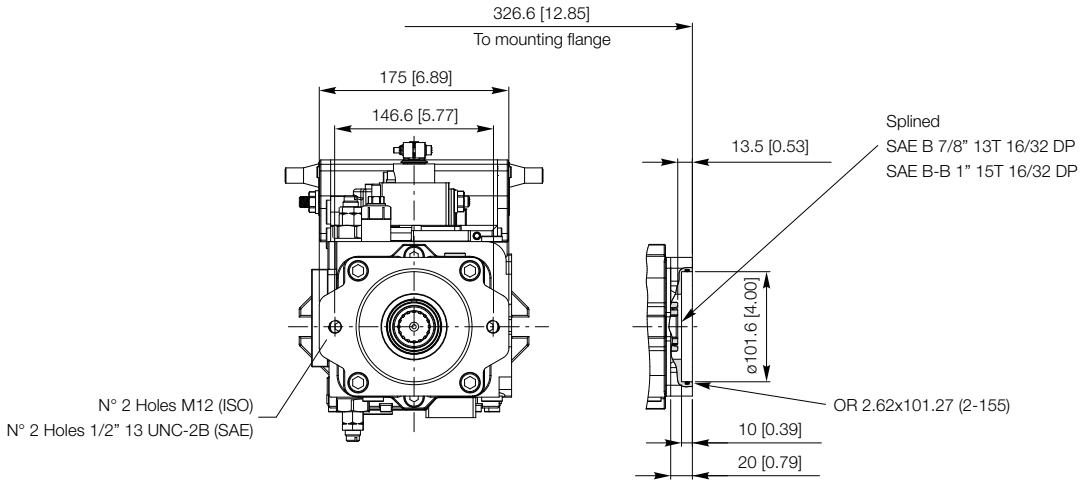
S6CV 075 - Throught drives dimensions

19 Throught drive

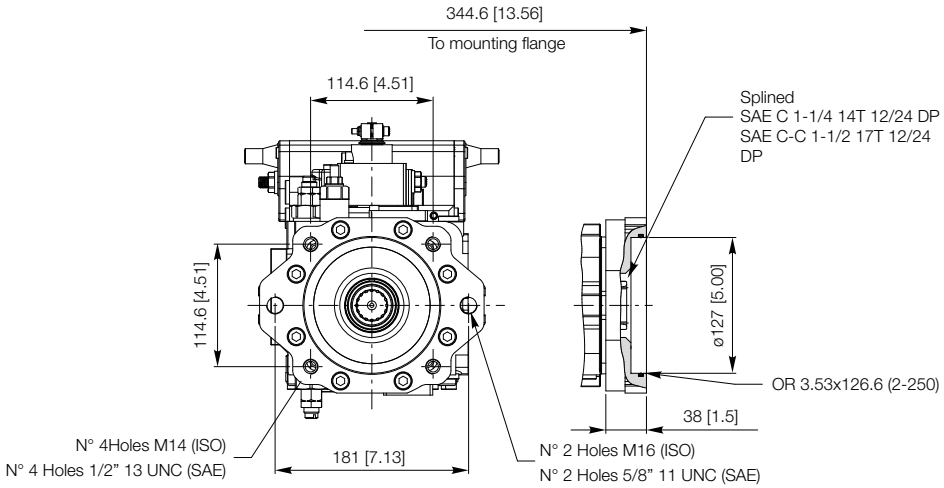
SA SAE A flange



SB/BB SAE B / SAE B-B flange

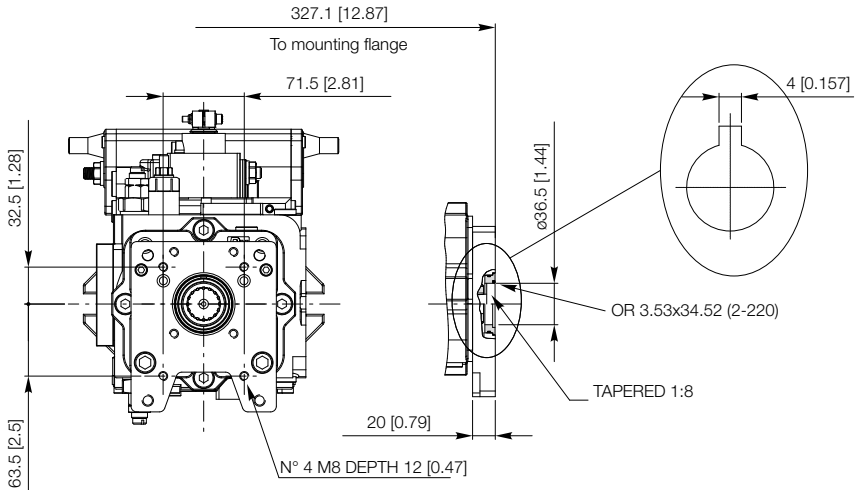


SC/CC SAE C / SAE C-C flange

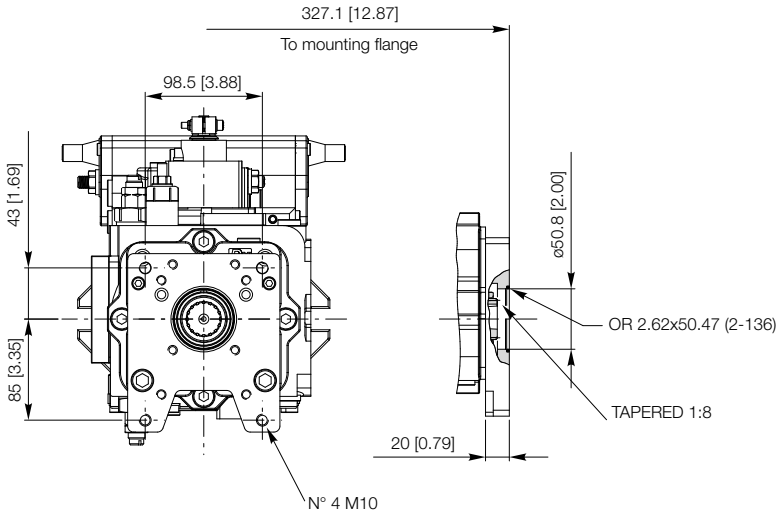


19 Throught drive

G2 G2 flange



G3 G3 flange



S6CV 128 - Ordering code

The following alphanumeric codes system has been developed to identify all of the configuration options for the S6CV 128 pumps. Use the model code below to specify the desired features.
All alphanumeric digits system of the code must be present when ordering. We recommend to carefully read the catalogue before filling the ordering code.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Series	Pump	Size	Displacement limitation side A	Displacement limitation side B	Version	Flange	Shaft end	Direction of rotation	Control	Control feature	Charge pump	Pressure relief valve side A	Pressure relief valve side B	Charge pressure relief valve	Pressure compensator and cut-off valves	Cut-off valves feature	Filter	Through drive	Flushing valve	Pump feature	Painting
S6CV	P	128	60	60	ME	11	BE	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

1

Series	
S6CV	Variable displacement axial piston pump for closed circuit

2

Pump	
P	Pump

3

Size	
128	128 cm³/rev [7.808 in³/rev]

4

Displacement limitation side A	
0+136	From 0 cm³/rev to 136 cm³/rev [8.296 in³/rev]

5

Displacement limitation side B	
0+136	From 0 cm³/rev to 136 cm³/rev [8.296 in³/rev]

S6CV 128 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

6

Version	
ME	ISO
SE	SAE

7

Mouting flange	
11	SAE-D 2/4 Bolts

8

Shaft end	
BF	Splined Z23 - 16/32" DP
BE	Splined Z27 - 16/32" DP
BG	Splined Z15 - 8/16" DP
BH	Splined Z13 - 8/16" DP
BI	Splined W45x2x30x21
BL	Splined W40x2x30x18

Note:
For Tandem assembly check chapter "TANDEM COMBINATION DIMENSIONS"

9

Direction of rotation (viewed from shaft side)	
DX	CW
SX	CCW

10

Control	
HLR	Manual lever with feed-back
HIR	Hydraulic proportional with feed-back
HIN	Hydraulic proportional without feed-back
HER	Electric proportional with feed-back
HEN	Electric proportional without feed-back
HE2	Electric on-off
HEH	Electric proportional with emergency hydraulic override
HFD	Electric fan drive control
HME	Electric Automotive
HMI	Hydraulic Automotive

S6CV 128 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

11

Control features				Control									
				HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
IH	Inching		Hydraulic inching	–	–	–	–	–	–	–	_	●	●
IM			Mechanical inching	–	–	–	–	–	–	–	–	–	–
00			Without inching	–	–	–	–	–	–	–	–	●	●
12	Voltage	(V)	12 connector DIN 43650	–	–	–	●	–	●	●	–	●	–
24		(V)	24 connector DIN43650	–	–	–	●	–	●	●	–	●	–
D2		(V)	12 - Deutsch DT04	–	–	–	●	–	●	●	–	●	–
D4		(V)	24 - Deutsch DT04	–	–	–	●	–	●	●	–	●	–
N2		(V)	12 AMP JUNIOR	–	–	–	–	●	–	–	●	–	–
N4		(V)	24 AMP JUNIOR	–	–	–	–	●	–	–	●	–	–
00	Control orifices diameter (1)	mm [in]	Without control orifices	S	●	–	●	●	–	–	●	–	–
05		mm [in]	Ø 0.5 [Ø 0.019]	–	–	●	–	–	–	–	–	–	–
06		mm [in]	Ø 0.6 [Ø 0.024]	–	●	–	●	–	–	–	–	–	_
07		mm [in]	Ø 0.7 [Ø 0.027]	–	●	●	●	–	–	–	–	–	–
08		mm [in]	Ø 0.8 [Ø 0.031]	–	S	S	S	–	–	S	–	–	–
09		mm [in]	Ø 0.9 [Ø 0.035]	–	●	●	–	–	–	–	–	–	–
10		mm [in]	Ø 1.0 [Ø 0.039]	–	●	–	–	–	–	–	–	–	–
12		mm [in]	Ø 1.2 [Ø 0.047]	–	●	–	–	–	S	–	–	S	S
15		mm [in]	Ø 1.5 [Ø 0.059]	–	–	–	–	–	–	–	–	●	●
20		mm [in]	Ø 2.0 [Ø 0.0787]	–	–	–	●	–	–	–	–	–	–
(*)	Starting speed	(rpm)		–	–	–	–	–	–	–	–	●	●
(*)	Maximum torque speed	(rpm)		–	–	–	–	–	–	–	–	●	●
(*)	Maximum torque value	(Nm)		–	–	–	–	–	–	–	–	●	●

(*) Supply the setting value.
• : Required
– : Not required
S: standard
(1) in case of the different response times, please you contact sales office

12

Charge pump		
00	Without charge pump	
23	Displacement 23.1 cm3/rev [1.41 in3/rev]	
27	Displacement 27.3 cm3/rev [1.647 in3/rev]	Standard

13

Pressure relief valve side A		
25	250 bar [3625 psi]	
35	350 bar [5075 psi]	
42	420 bar [6090 psi]	Standard

S6CV 128 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

14

Pressure relief valve side B		
25	250 bar [3625 psi]	
35	350 bar [5075 psi]	
42	420 bar [6090 psi]	Standard

15

Charge pressure relief valve			Control									
			HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
AF	22 bar a 1000 rpm [319 psi at 1000 rpm]	Standard	●	●	●	●	●	●	●	–	●	●
AG	25 bar a 1000 rpm [319 psi at 1000 rpm]		●	●	●	●	●	●	●	●	●	●

16

Pressure compensator and Cut-Off valves			Control									
			HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
XX	Without pressure compensator	Standard	●	●	●	●	●	●	●	●	●	●
PC	Pressure compensator		●	●	●	●	●	●	●	●	–	–
TE	Electric Cut-Off		●	●	●	●	●	●	●	●	–	–
EP	Electric Cut-Off + Pressure Compensator		●	●	●	●	●	●	●	●	–	–

17

Cut-Off valves feature			Cut-Off valves			
			XX	PC	TE	EP
000	Feature not necessary		●	–	–	–
000	Pressure Setting (bar)	Locked	–	●	–	●
100÷400	Pressure Setting (bar)	100÷400 bar (*)	–	●	–	●
12	Voltage	12 V	–	–	●	●
24	Voltage	24 V	–	–	●	●

• : Required
– : Not required
(*) Supply the setting value

S6CV 128 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

18

Filter			Control									
			HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
XX	Without Filter	Standard	●	●	●	●	●	●	●	●	●	●
M8	Optical clogging sensor (8 bar) [116 psi]		●	●	●	●	●	●	●	●	–	–
E9	Electric clogging sensor (8 bar) [116 psi]		●	●	●	●	●	●	●	●	–	–
E3	Electric clogging sensor (8 bar) [116 psi] + DIN 43650 connector		●	●	●	●	●	●	●	●	–	–
E2	Electric clogging sensor (8 bar) [116 psi] + DIN 43650 connector with LED 24V		●	●	●	●	●	●	●	●	–	–
E1	Electric clogging sensor (8 bar) [116 psi] + DIN 43650 connector with LED 12V		●	●	●	●	●	●	●	●	–	–
FR	Through drive remote filter		●	●	●	●	●	●	●	●	=	=

● : Available
– : Not available
= : Not available for HME/HMI + Cut-Off valve TE/TP

Note:
E9 feature as “Standard production” for electric clogging sensor

19

Through drive		
Through drive for 2ndPump assembled by the customer		
XX	Without through drive	Standard
SA	SAE A = Z9 - 16/32 DP	
SB	SAE B = Z13 - 16/32 DP	
BB	SAE B-B = Z15 - 16/32 DP	
SC	SAE C = Z14 - 12/24 DP	
S5	SAE C = Z21 - 16/32 DP	
CC	SAE C-C = Z17 - 12/24 DP	
SD	SAE D = Z13 - 12/24 DP	
G2	GR2 L = 4	
G3	GR3	
Through drive for 2nd pump assembled by Dana		
TA	Tandem through drive with flange SAE A = 9T - 16/32 DP	
TB	Tandem through drive with flange SAE B = 13T - 16/32 DP	
TZ (1)	Tandem through drive with flange SAE B-B = 15T - 16/32 DP (Special for S5AV 032/045/050/063 pumps)	
TY (2)	Tandem through drive with flange SAE B - DIN 5480 W35x2x30x16x9g (Special for S5AV 050/063 pumps)	
BT	Tandem through drive with flange SAE B-B = 15T - 16/32 DP	
TC	Tandem through drive with flange SAE C = 14T - 12/24 DP	
T5	Tandem through drive with flange SAE C = 21T - 16/32 DP	
CT	Tandem through drive with flange SAE C = 21T - 16/32 DP	
TD	Tandem through drive with flange SAE D = 13T - 8/16 DP	
TJ	Tandem through drive with flange SAE D = 23T - 16/32 DP	

(1) Tandem S6CV 75 + S5AV 032/045/050/063 with shaft Z15 16/32 DP
(2) Tandem S6CV 75 + S5AV 050/063 with shaft DIN 5480 W35x2x30x16x9g

S6CV 128 - Ordering code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S6CV	P	075	60	60	ME	06	AC	DX	HME	24	00	25	25	AF	PC	000	XX	XX	XX	XXX	01

20

Flushing valve		Controls									
		HLR	HIR	HIN	HER	HEN	HE2	HEH	HFD	HME	HMI
XX	Not request	●	●	●	●	●	●	●	●	●	●
PR	Arranged for Flushing Valve	–	–	–	–	–	–	–	–	●	●
06	6 l/min [1.58 U.S. gpm] Orifice Diameter Ø 1.5 [0.005]	–	–	–	–	–	–	–	–	●	●
09	10.5 l/min [2.77 U.S. gpm] Orifice Diameter Ø 2.0 [0.07]	–	–	–	–	–	–	–	–	●	●
15	15 l/min [3.96 U.S. gpm] Orifice Diameter Ø 2.5 [0.09]	–	–	–	–	–	–	–	–	●	●

● : Available
– : Not available

21

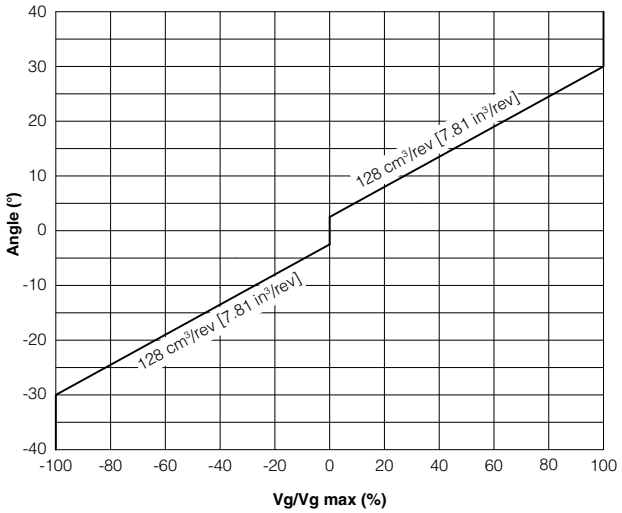
Pump feature	
XXX	Not request
DT4	Conversion cable from DIN43650/ISO4400 to Deutsch DT04 connector
001	ISO Version with SAE Through drive

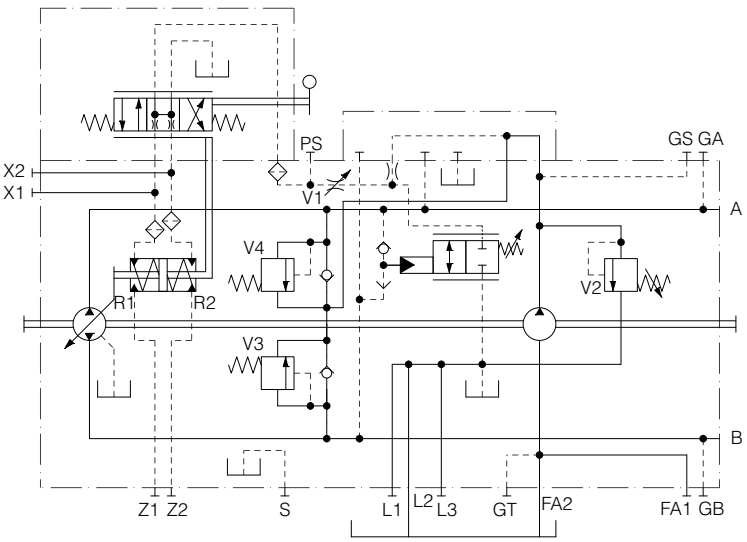
22

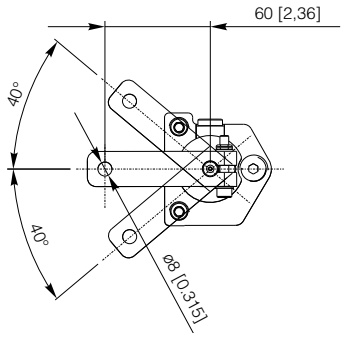
Painting	
XX	Not request
01	Black Painted RAL 9005

10 Control

The displacement of the pump is directly proportional to the angle of rotation of the lever. The feedback system feels the position of the swashplate and works automatically to compensate for a positioning error. The diagram below shows the ralationship between angle and displacement.





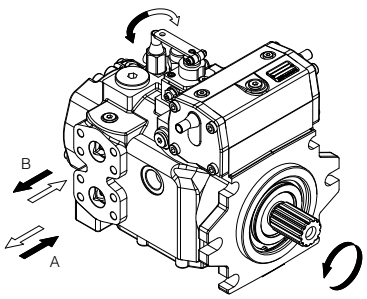


The torque necessary at the control lever is between 1 and 2.45 Nm [0.737 and 1.80 lbf·ft].

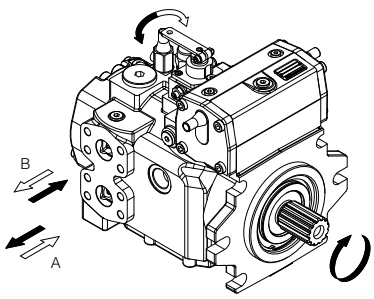
Note:
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

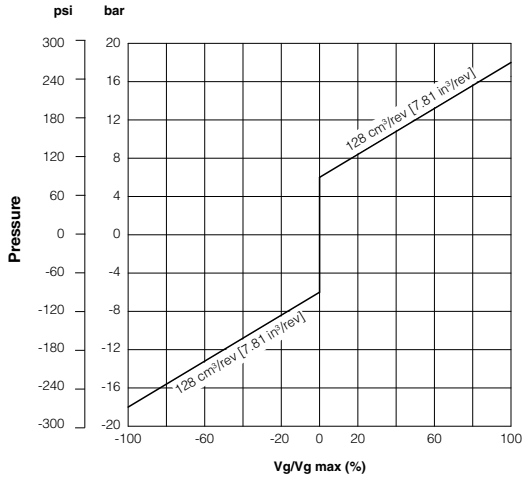
HLR (CCW)

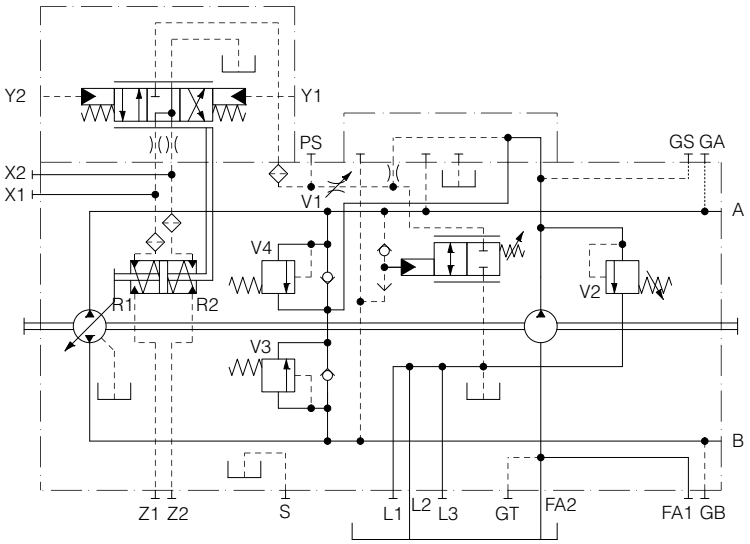


HLR (CW)



The pump displacement is proportional to the pilot pressure on Y1 or Y2 ports, which also affect flow direction. The feedback system feels the position of the swashplate and works automatically to compensate for a positioning error. Piloting can be provided by boost pressure from GS port. The piloting pressure will then have to be controlled by a joystick or by a pressure reducing valve (not supplied).





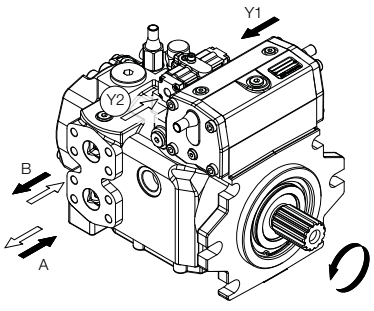
Pilot pressure = 6÷18 bar [87÷261 psi] (at ports Y1, Y2)
Start of control = 6 bar [87 psi]
End of control = 18 bar [261 psi] (Max displacement)

Note:
The tolerance on piloting pressure is ± 10% of maximum value.

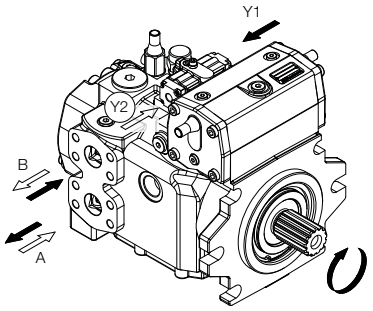
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

HIR (CCW)



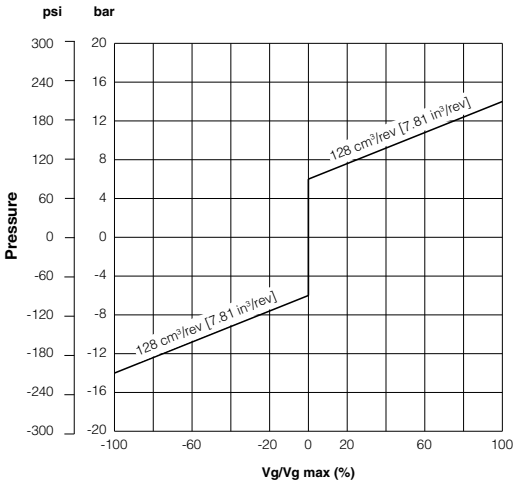
HIR (CW)

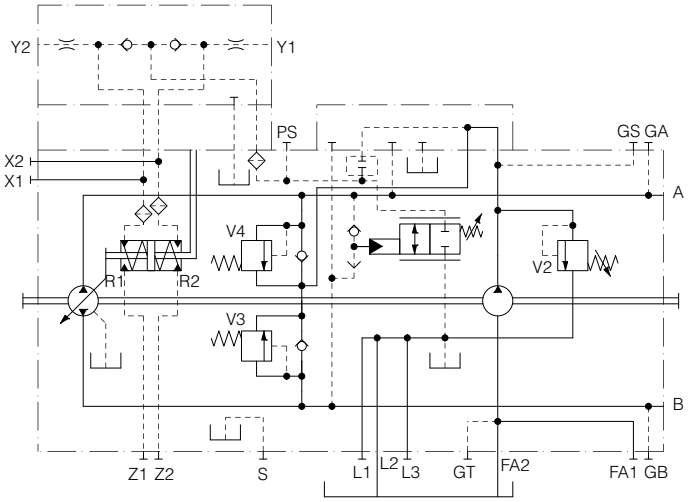


S6CV 128 - Hydraulic proportional control without feed-back HIN

The pump displacement is proportional to the pilot pressure on Y1 or Y2 piloting ports, which also affect flow direction. The flow is also influenced by the working pressure and by the rotation speed of the pump. With a given input signal (piloting pressure) the pump can vary the displacement and the flow when working pressure or rotating speed change. Feeding pressure to the control joystick can be provided by charge pressure from GS port. The piloting pressure must then be controlled by said joystick or by a pressure reducing valve (not supplied). The orifice dimensions must be choosed in function of the response time required, see the table below.

Warning:
HIN control could require working parameters review. Please contact Dana technical service



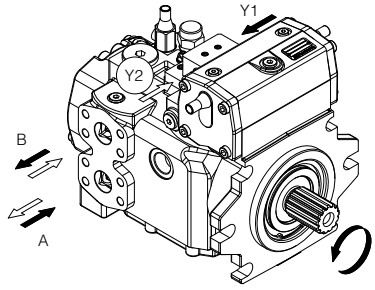


Pilot pressure = 6÷14 bar [87÷ 203 psi] (at ports Y1, Y2)
Maximum Pilot pressure = 30 bar [435 psi]
Start of control = 6 bar [87 psi]
End of control = 14 bar [203 psi](Max displacement)

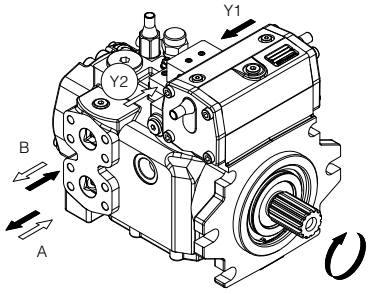
Note:
The tolerance on piloting pressure is ± 10% of maximum value.

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

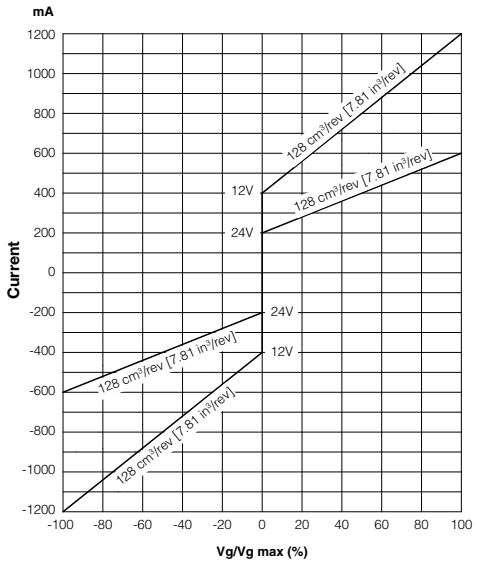
HIN (CCW)

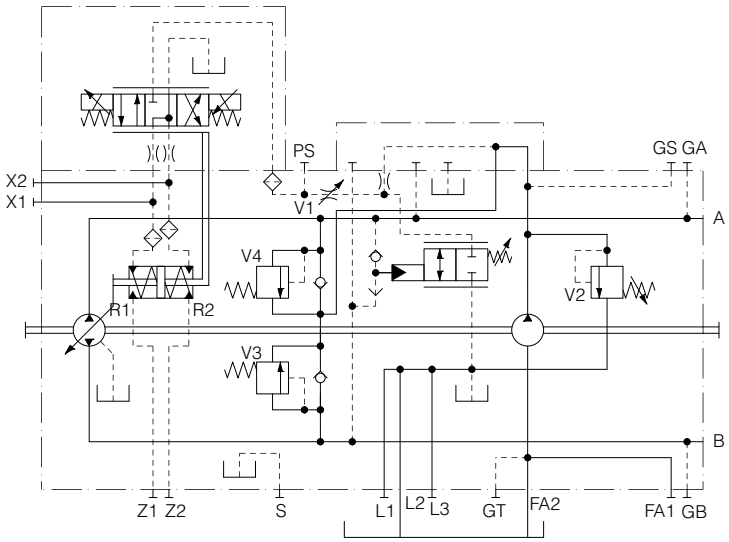


HIN (CW)



The displacement of the pump is directly proportional to the input current of one of the two proportional solenoids. The feedback system feels the position of the swashplate and works automatically to compensate for a positioning error. The input current of the two proportional solenoids must be controlled by an external amplifier card and it is recommended to use our amplifier specific for S6CV. Flow direction depends on which solenoid is energized. Standard solenoids are proportional at 24V d.c. max. current 1A. (Optional solenoids 12V d.c. max. current 2A).
For emergency operation only it is however possible to control solenoids directly with 24V d.c.voltage (or 12V d.c.), by-passing the amplifier.





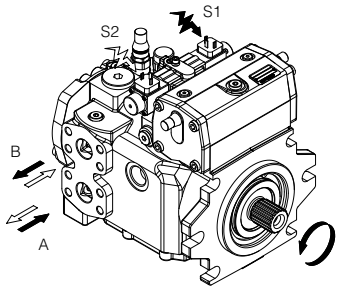
Solenoid 24V:
Current min. 200 mA max 600 mA
Solenoid 12V:
Current min. 400 mA max 1200 mA

Note:
The tolerance on piloting current is ± 10% of maximum value.

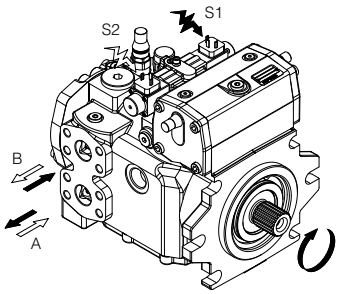
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

HER (CCW)

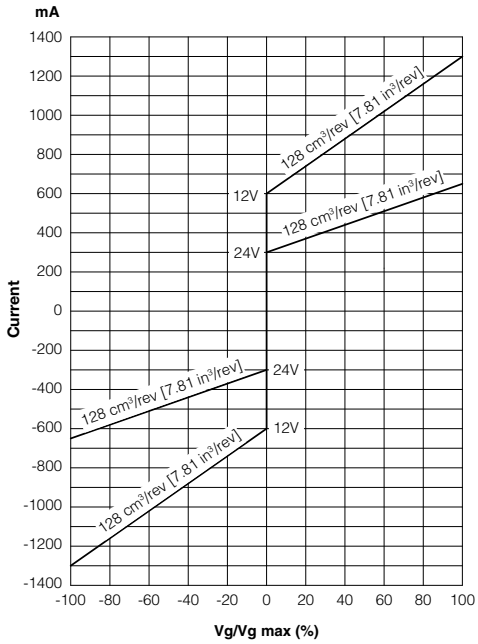


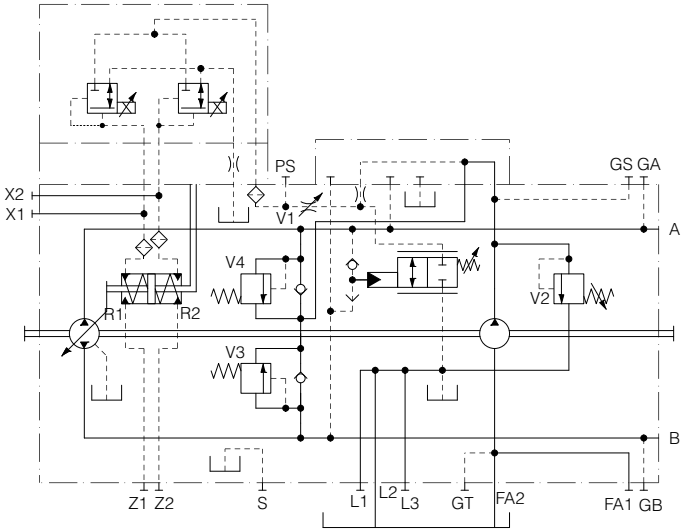
HER (CW)



The displacement of the pump is directly proportional to the input current of one of the two proportional solenoids. The flow is also influenced by the working pressure and by the rotation speed of the pump. With a given input signal (piloting current) the pump can vary the displacement and the flow when working pressure or rotating speed change. The input current of the two proportional solenoids must be controlled by an external amplifier card and it is recommended to use our amplifier specific for S6CV. Flow direction depends on which solenoid is energized. Standard solenoids are proportional 24V d.c. max. current 1A. (Optional solenoids 12V d.c. max. current 2A). For emergency operation only it is however possible to control solenoids directly with 24V d.c.voltage (or 12V d.c.), by-passing the amplifier.

Warning:
HEN control could require working parameters review. Please contact Dana technical service



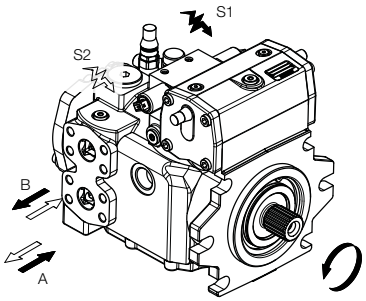


Solenoid 24V:
Current min. 300 mA max 650 mA
Solenoid 12V:
Current min. 600 mA max 1300 mA

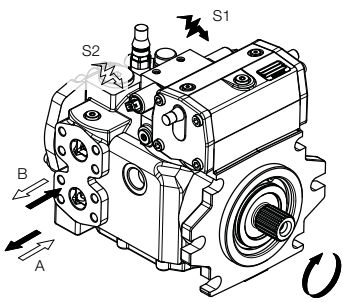
Note:
The tolerance on piloting current is ± 10% of maximum value.

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

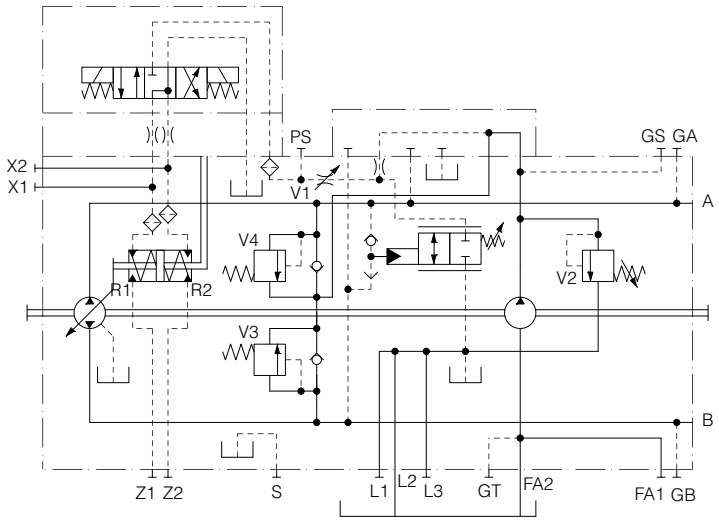
HEN (CCW)



HEN (CW)

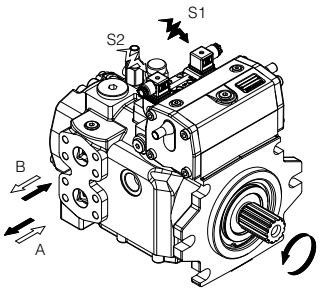


By switching on one of the solenoids the pump swivels to maximum displacement in the corresponding output flow direction.
Switching off the stated solenoid will result in swivelling back the pump to zero displacement position.

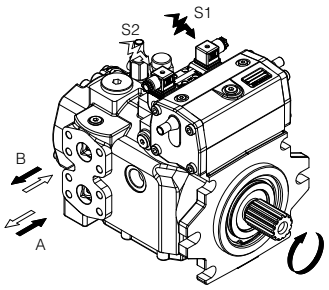


Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

HE2 (CCW)

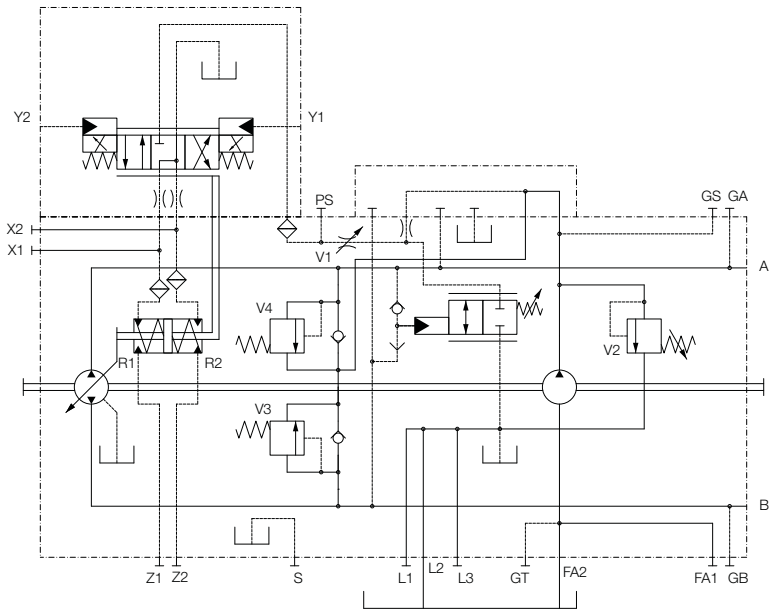


HE2 (CW)



S6CV 128 - Electric proportional control with hydraulic emergency override HEH

This control has the same electric proportional features of HER control, but it also has an emergency hydraulic proportional control capability when a pilot pressure on Y1 and Y2 ports. The input current of the two proportional solenoids must be controlled by an external amplifier card and it is recommended to use our amplifier specific for S6CV. Hydraulic operation of HEH control is meant to be an emergency device to control displacement of the pump in case of a breakdown of the electric circuit. A pilot pressure of 22 bar [319 psi] is required to swivel the pump to max displacement in emergency operation.

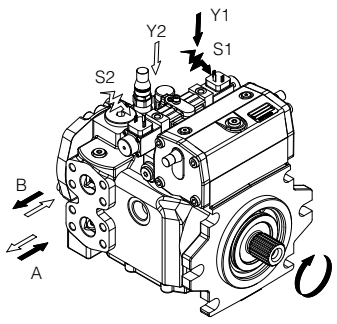


Warning:
Y1 and Y2 ports must not have any back pressure normal electric control operation (vented to tank).

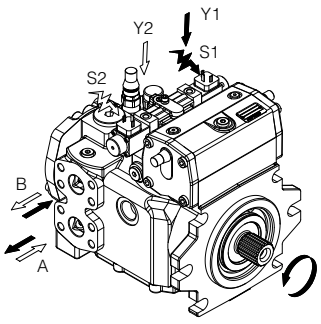
Note:
The spring return feature in the control units is not a safety device.
The spool valve inside the control unit can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator. Check whether your application requires that remedial measures be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

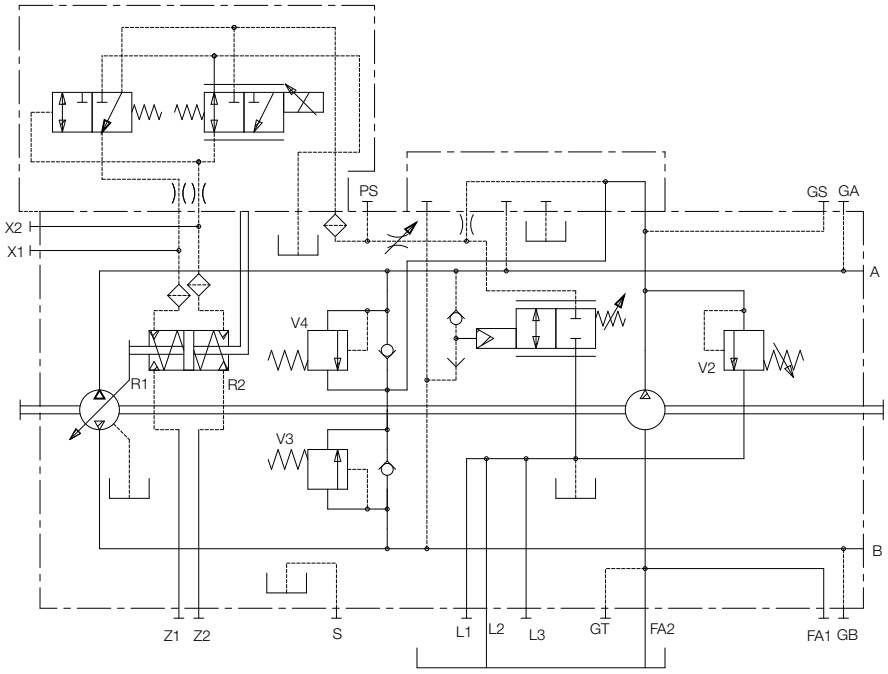
HEH (CCW)



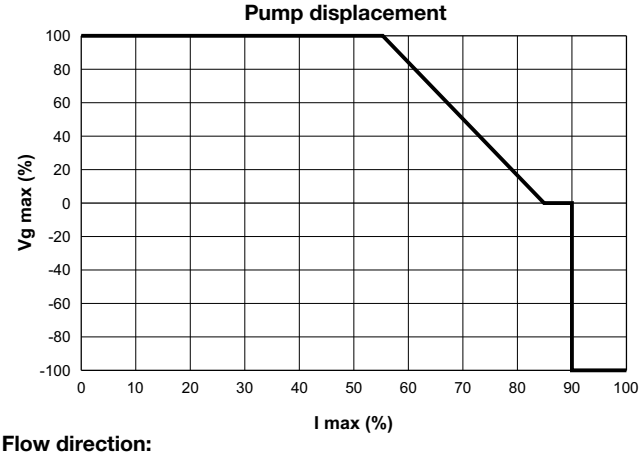
HEH (CW)



Fan drive control (HFD) is a non-feedback control electrically operated.
Pump displacement is directly proportional to the input current on the proportional solenoid. Flow is also influenced by working pressure and rotation speed, with a given input signal pump can vary displacement and flow due to working pressure and speed rotation variation.
Input current must be control by an external amplifier.
Flow direction depends on pump direction of rotation and on input current (see below diagram).



Pump displacement

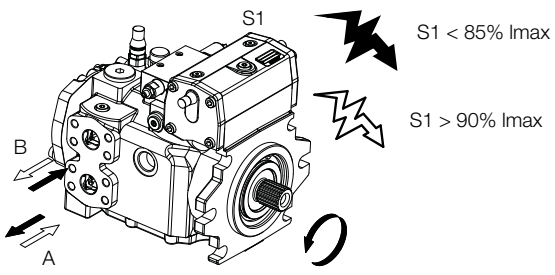


Voltage	I max	Protection	Resistance	Connector
12 VDC	1.5 A	DIN VDE 0470 / EN 60 529 -IP65	3.85 Ohm	AMP Junior Timer
24 VDC	0.75 A		15.15 Ohm	

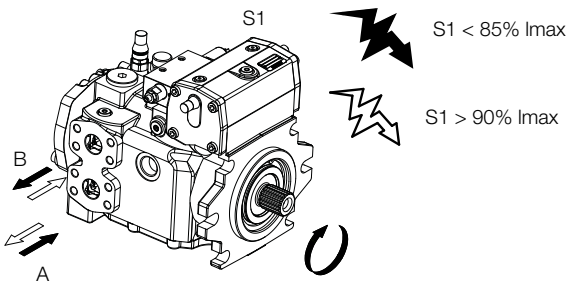
Minimum boost pressure 25 bar - 363 PSI.

Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.
Flow direction depending to the I max current value.

HFD (CCW)



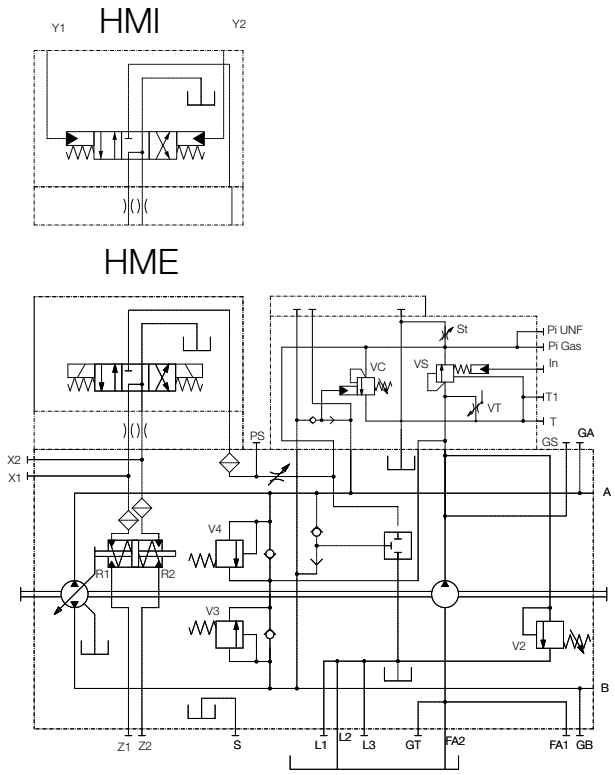
HFD (CW)



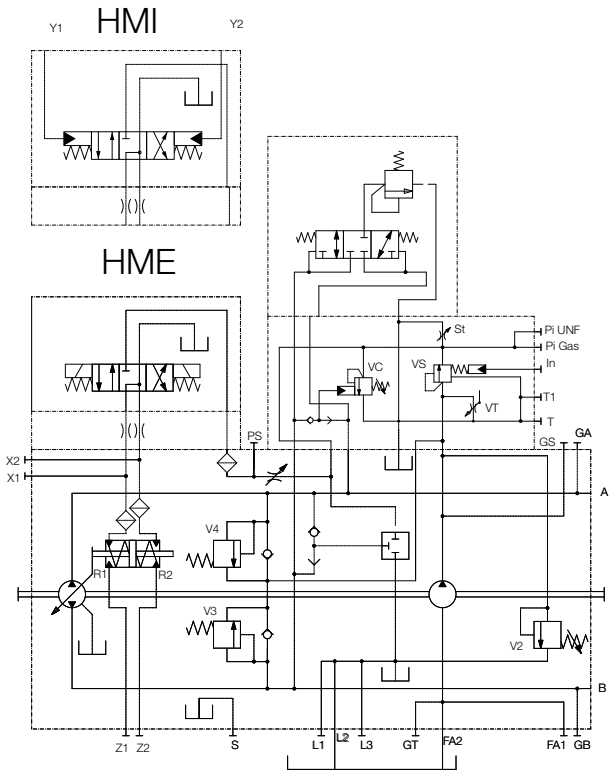
The “AUTOMOTIVE” (speed related) control, is used in hydrostatic transmissions with closed loop variable displacement pumps. This kind of controls allows to:
- Control of the vehicle translation speed;
- Limit the amount of Torque required from the Engine;
- Inching of the vehicle speed. The control of the Inching valve can be done with an hydraulic signal (Minimum 12 bar [174 psi] is required to swivel the pump to null displacement) or with a lever.
- Possibility to control the direction of flow electrically (HME) and hydraulically (HMI).

To allows an oil cooling action, when operating at high speed and power, it is possible to mount a flushing valve.

Electric (HME) / hydraulic (HMI) automotive with hydraulic Inching (IH)

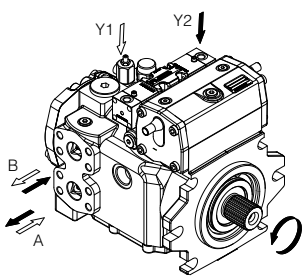


Electric (HME) / hydraulic (HMI) automotive with hydraulic Inching (IH) + Flushing valve

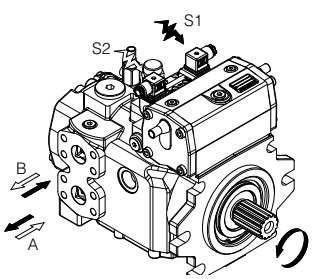


Flow direction:
Correlation between direction of rotation (shaft view) control and direction of flow.

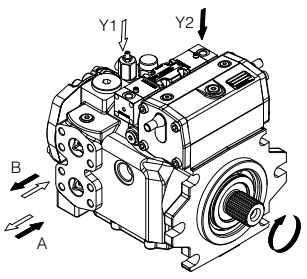
HMI (CCW)



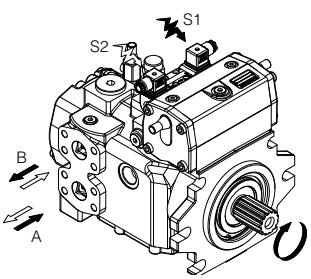
HME (CCW)



HMI (CW)



HME (CW)



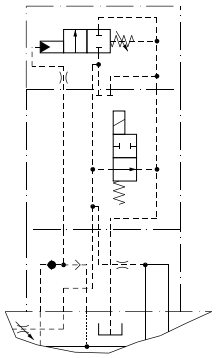
16 Pressure compensator and Cut-Off valve

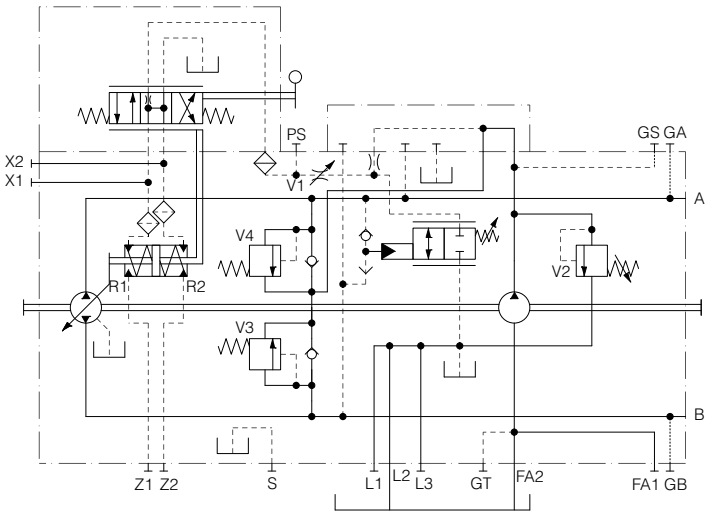
PC Pressure compensator valve

The pressure compensator valve is meant to avoid opening of the relief valves: whenever working pressure reaches the PC valve setting, the swashplate is swivelled back reducing flow. The valve allows to maintain a costant pressure in the circuit at the setting value. It is advisable to fit the cut-off valve to all system where pressure peaks close to the relief valves setting value occur or in hydraulic systems engineered to the maximum pump pressure. It is recommended to set the pressure cut-off valve at 30 bar [435 psi] lower than the high pressure relief valve setting. Setting range:100÷400 bar [1450÷5800 psi].

Note:
The pressure compensator valve is standard on HD1 pump and it can be combined with TE (EP) valve.

EP valve



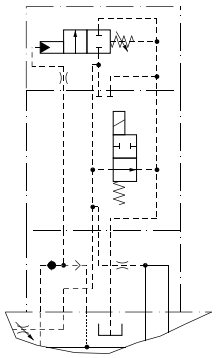


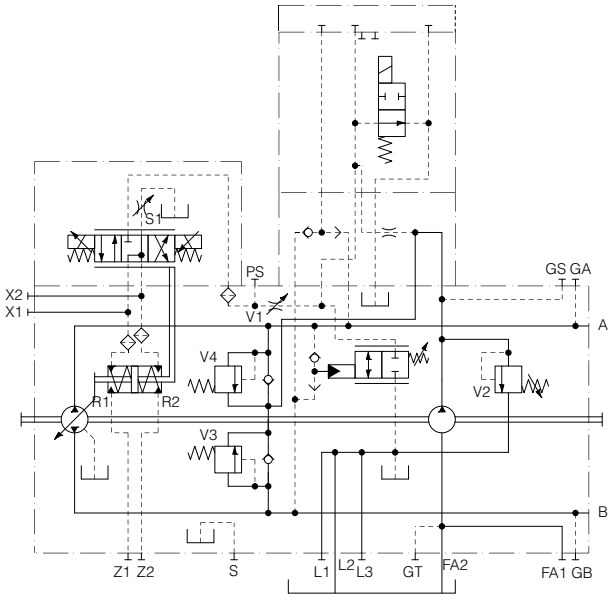
TE Electric Cut-Off valve

The electric cut-off valve, directly flangeable on S6CV pump housing, swivels back to zero the pump flow when power supply to the ON/OFF solenoid is cut-off. This valve has been designed for applications subject to safety rules, which required stopping of the machine in case of no electric signal. Feed voltage is 24V d.c. (optional 12V d.c.).

Note :
The electric Cut-Off valve can be assembled on standard S6CV pump and it can be combined with PC (EP) valve.

EP valve



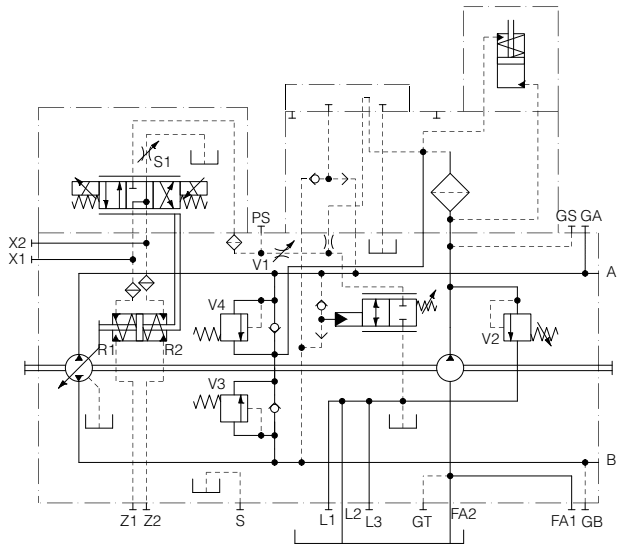


S6CV 128 - Pressure filter

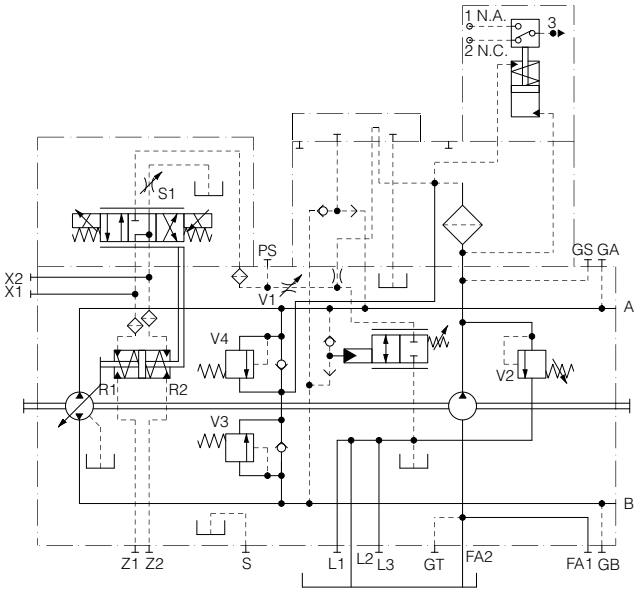
18 Filter

In order to guarantee an optimum fluid contamination level in the closed loop the S6CV can be equipped with a filter positioned on the delivery outlet of the charge pump. Only the flow necessary to reintegrate the lost oil due to leakage will pass through the filter, all the excess flow is not filtered and discharged through the pump drain line. In this way a longer life of the filter is achieved. The filter contains a composite fibre filtering element, with capacity of 12 micron absolute. The system uses sensors of clogging differential pressure of 8 bar [116 psi]) in optical and electrical (Connector DIN43650/ISO4400) version.
It is available a conversion cable from DIN43650/ISO4400 to Deutsch DT04 connector. The filter is without by-pass.
It is available a Remote Filter version for filtering in filter pressure not mounted on the pump.
It's possible to combine the filter with both cut-off valves.

M8 Optical sensor

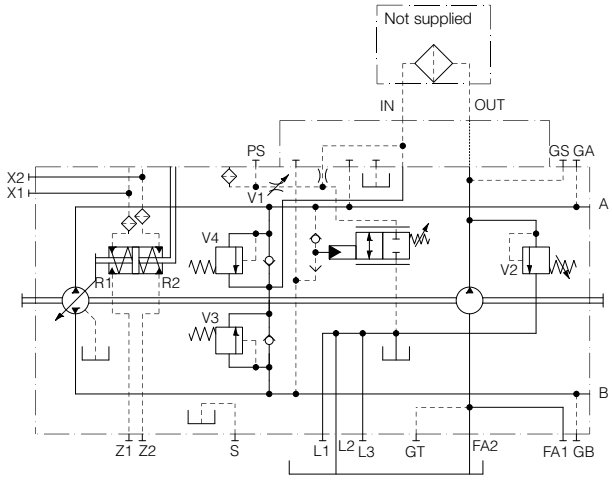


E1 - E2 - E3 - E9 Electrical sensor



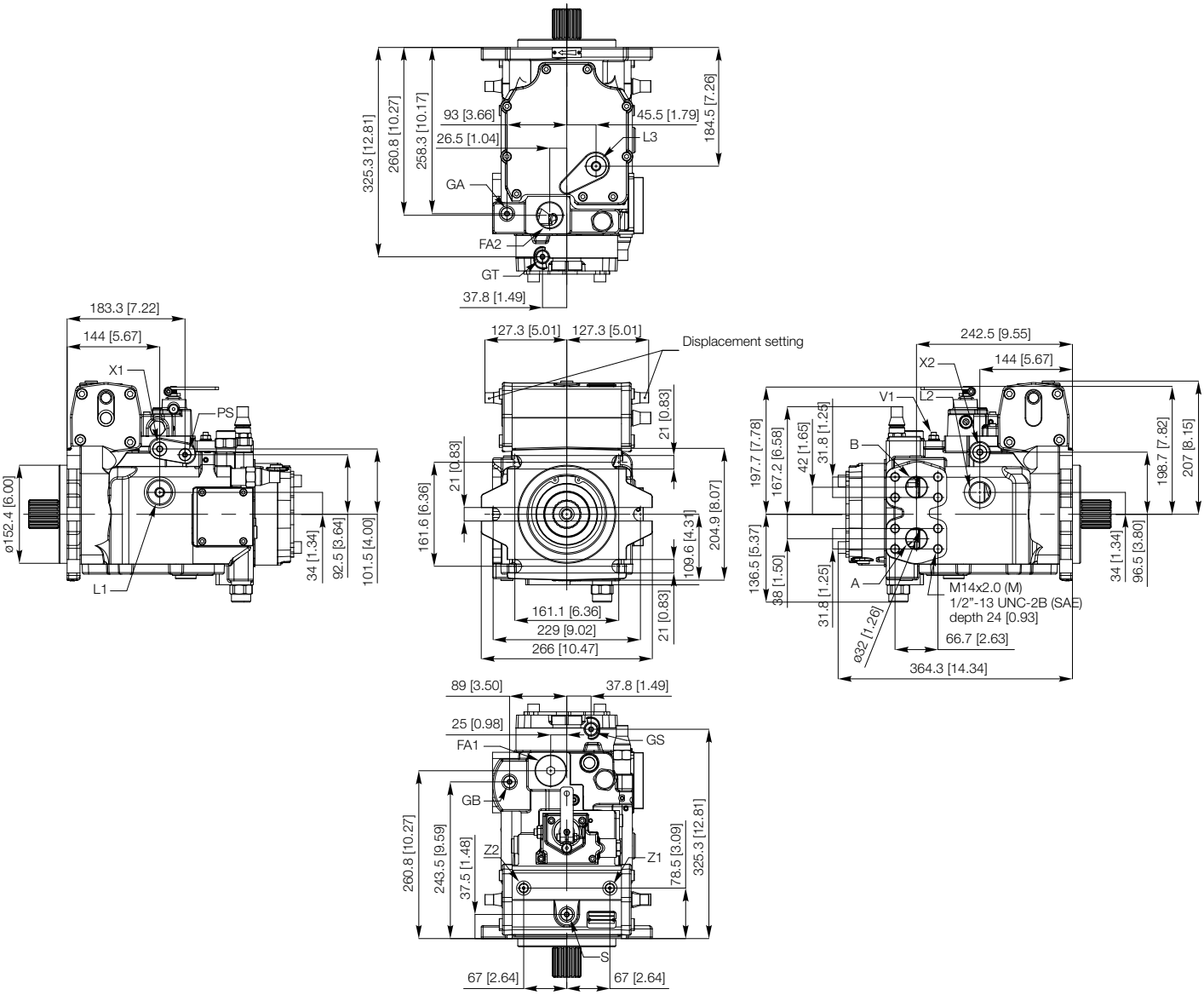
Share contact SPDT	Max. resistive load	Max. inductive load
C.A./A.C. 125-250 V	1 A	1 A
C.C./D.C. 30V	2 A	2 A
C.C./D.C. 50V	0.5 A	0.5 A
C.C./D.C. 75V	0.25 A	0.25 A
C.C./D.C. 125V	0.20 A	0.03 A

FR Remote filter



10 Control

HLR

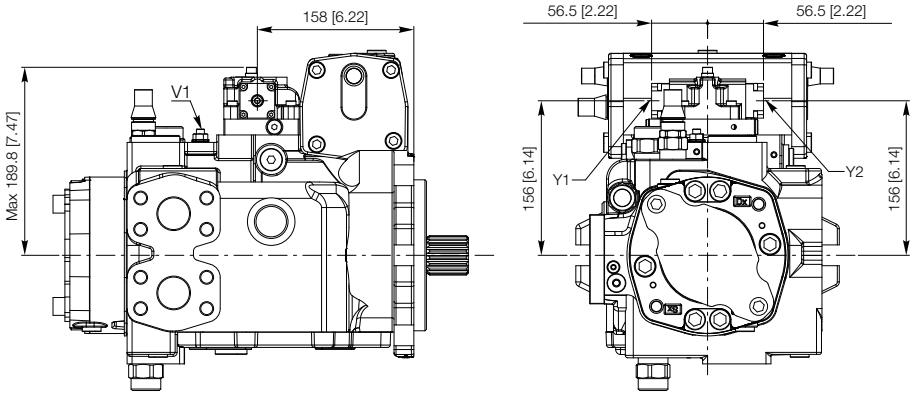


	Ports	ISO	SAE
A-B	Pressure ports	1" ¼ SAE 6000 psi	
L1-L2	Case drain ports	1" G (BSPP) Depth 18	1-5/16"-12UN-2B Depth 24
L3	Case drain ports	3/4" G (BSPP) Depth 15	1-1/16"-12UN-2B Depth 19
FA1-FA2	Boost pump suction port	1-1/4"G (BSPP) Depth 21	1-5/8"-12UN-2B Depth 24
GA-GB	Pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
GS	Boost pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
PS	Control pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
X1-X2	Gauge port stroking chamber	3/8" G (BSPP) Depth 13	
S	Bleed port	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
Z1-Z2	Control pressure gauge	1/8" G (BSPP) Depth 10	7/16"-20UNF-2B Depth 16
GT	Boost inlet pressure gauge	1/4" G (BSPP) Depth 13	7/16"-20UNF-2B Depth 16
V1	Adjustable throttle valve		

S6CV 128 - Pump and controls dimensions

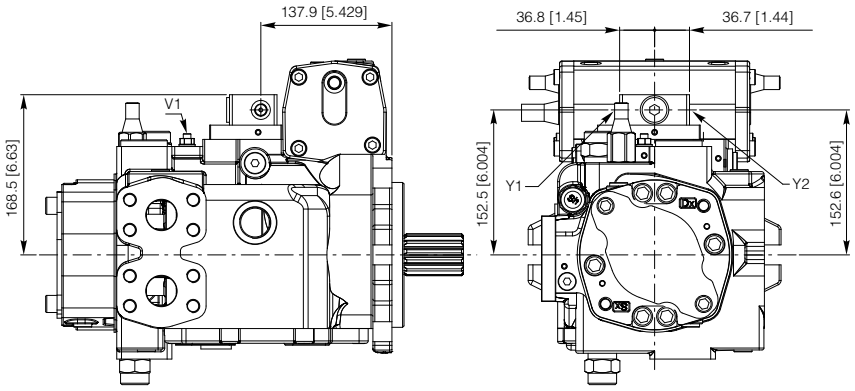
10 Control

HIR



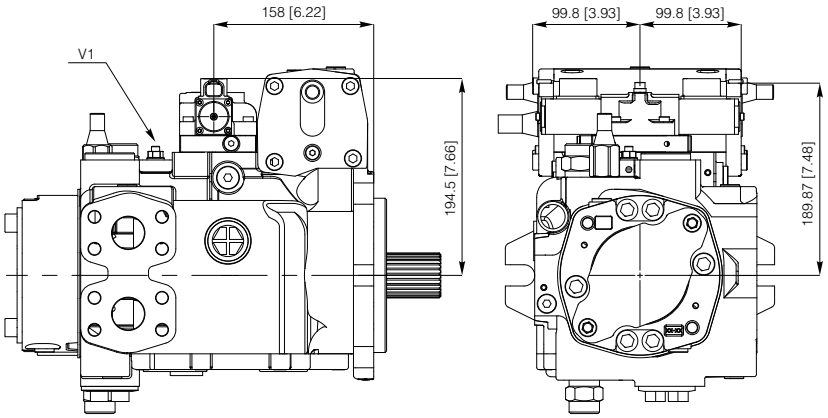
Y1, Y2: Control piloting pressure ports -1/4” G (BSPP) (ISO) - 7/16” - 20 UNF 2B (SAE)
V1: Adjustable throttle valve

HIN



Y1, Y2: Control piloting pressure ports -1/4” G (BSPP) (ISO) - 7/16” - 20 UNF 2B (SAE)
V1: Adjustable throttle valve

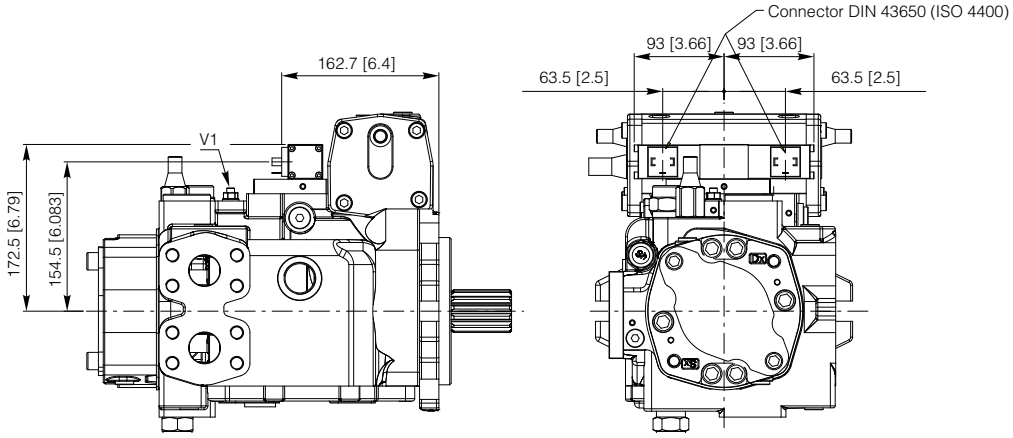
HER



V1: Adjustable throttle valve

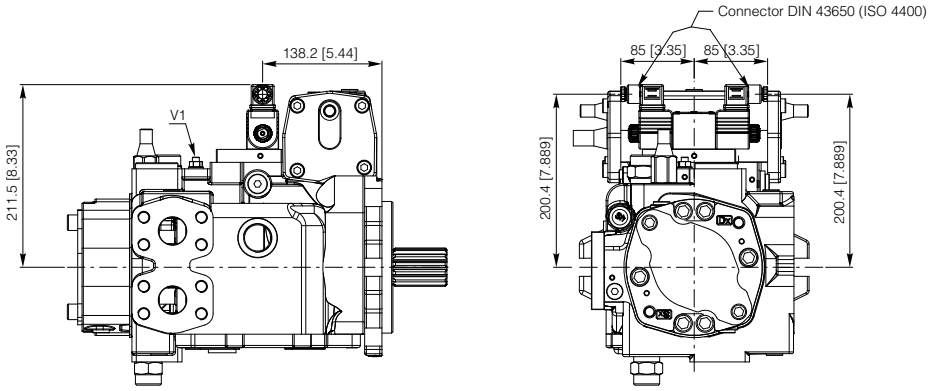
10 Control

HEN



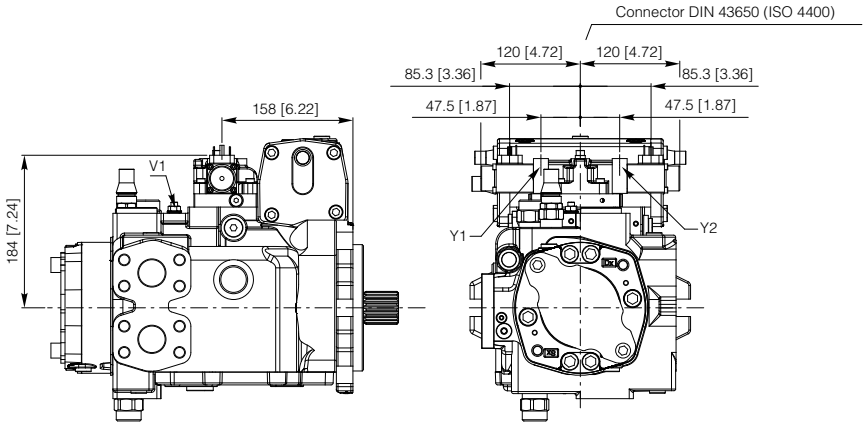
V1: Adjustable throttle valve

HE2



V1: Adjustable throttle valve

HEH

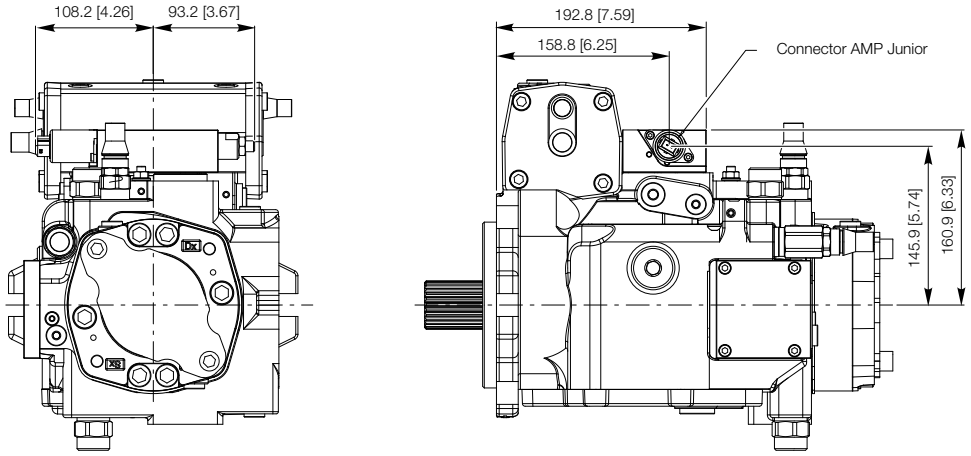


Y1, Y2: Control piloting pressure ports -1/8" G (BSPP) (ISO) - 5/16" - 24 UNF (SAE)
V1: Adjustable throttle valve

S6CV 128 - Pump and controls dimensions

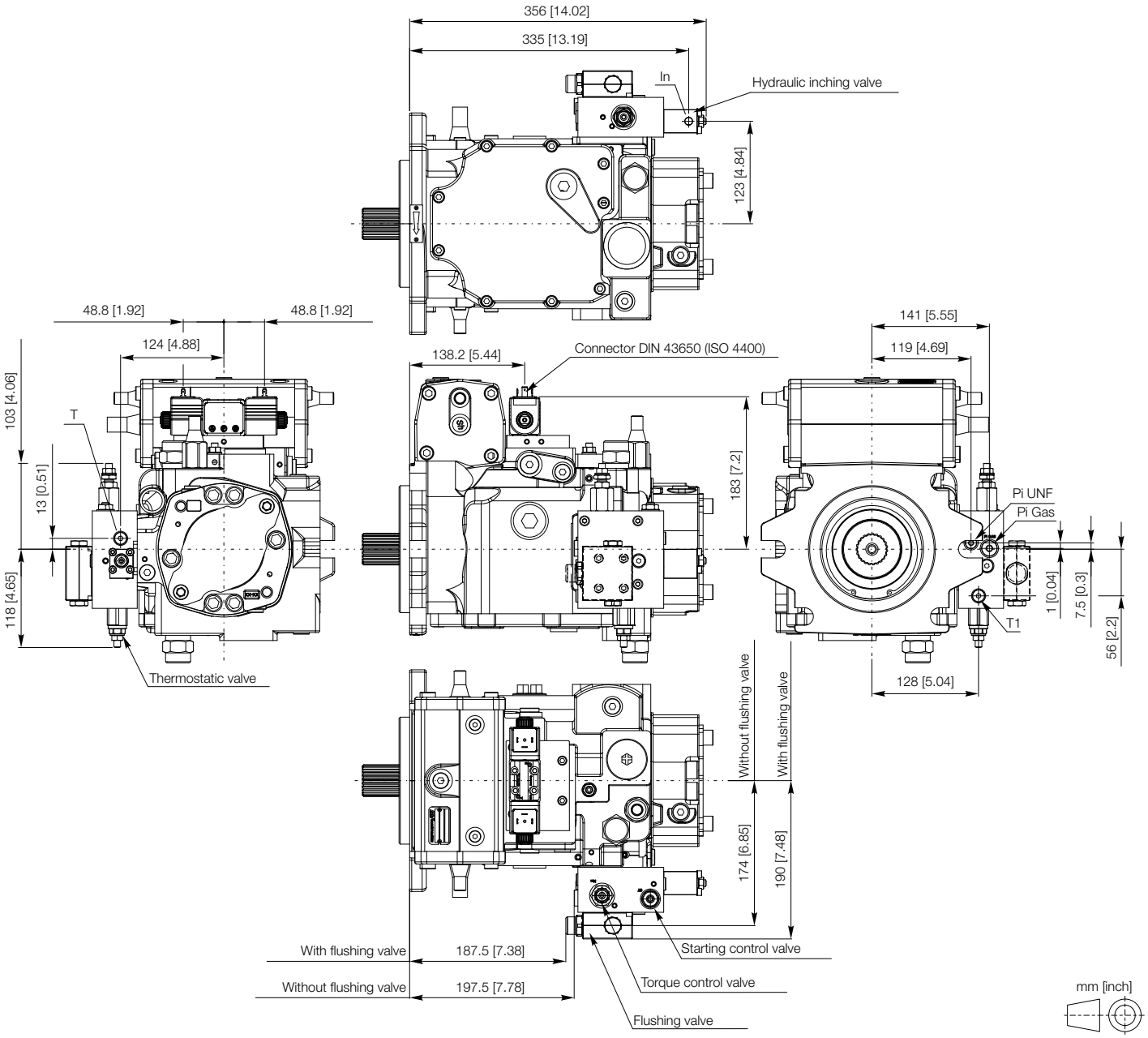
10 Control

HFD



10 Control

Automotive HME with hydraulic Inching (IH)

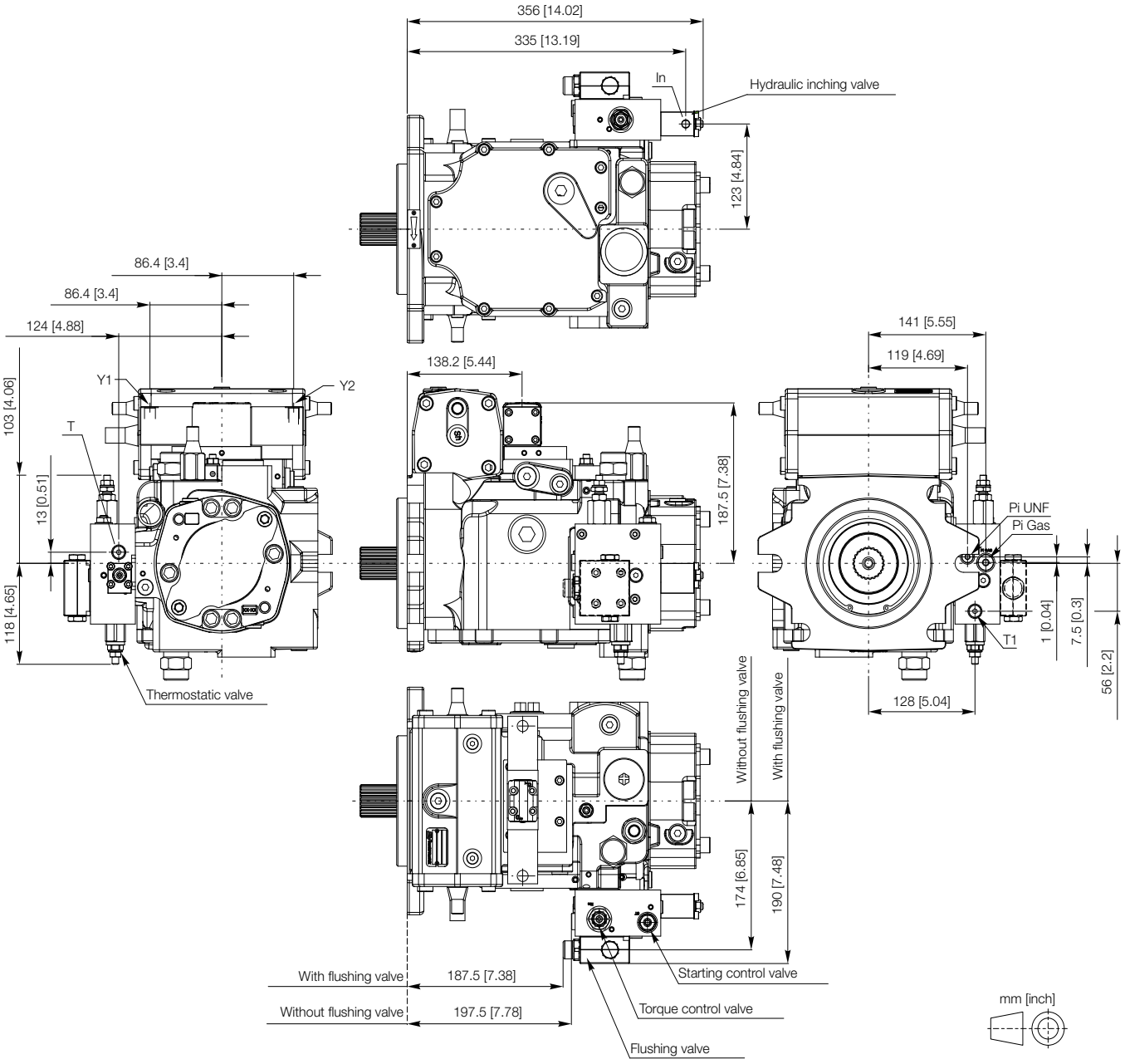


Pi Gas: Piloting pressure gauge port - 1/4" G (BSPP) (ISO)
Pi UNF: Piloting pressure gauge port - 7/16" - 20 UNF (SAE)
In: Piloting pressure Inching port - 1/8" G (BSPP) (ISO) - 7/16" - 20 UNF with Nipple (SAE)
T1: Drainage pressure gauge port - 1/8" G (BSPP)
T: Drainage pressure gauge port - 1/4" G (BSPP)

S6CV 128 - Pump and controls dimensions

10 Control

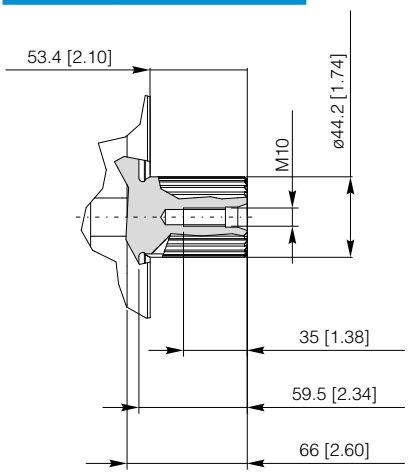
Automotive HMI with hydraulic Inching (IH)



Y1-Y2: Control piloting pressure ports - 1/4" G (BSPP) (ISO) - 7/16" - 20 UNF with Nipple (SAE)
Pi Gas: Piloting pressure gauge port - 1/4" G (BSPP) (ISO)
Pi UNF: Piloting pressure gauge port - 7/16" - 20 UNF (SAE)
In: Piloting pressure Inching port - 1/8" G (BSPP) (ISO) - 7/16" - 20 UNF with Nipple (SAE)
T1: Drainage pressure gauge port - 1/8" G (BSPP)
T: Drainage pressure gauge port - 1/4" G (BSPP)

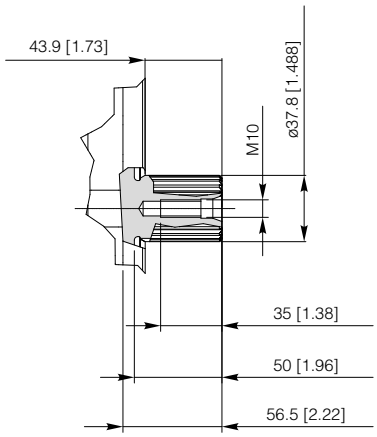
8 Shaft end

BE Splined



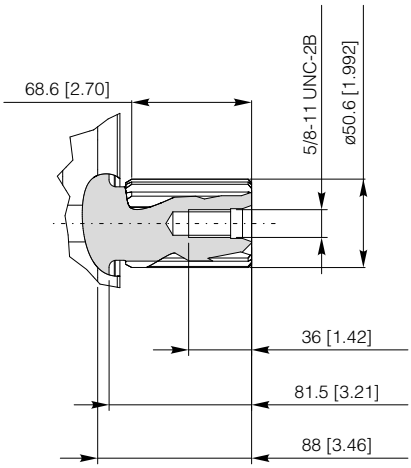
27T 16/32" DP - ANSI B92.1a - 1976 FLAT ROOT

BF Splined



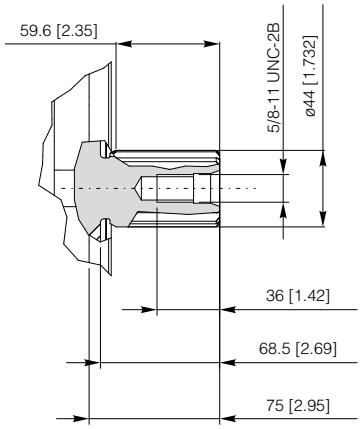
23T 16/32" DP - ANSI B92.1a - 1976 FLAT ROOT

BG Splined



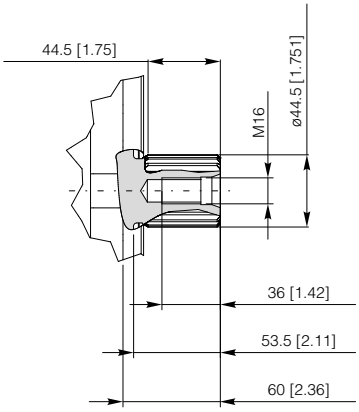
15T 8/16" DP - ANSI B92.1a - 1976 FLAT ROOT

BH Splined



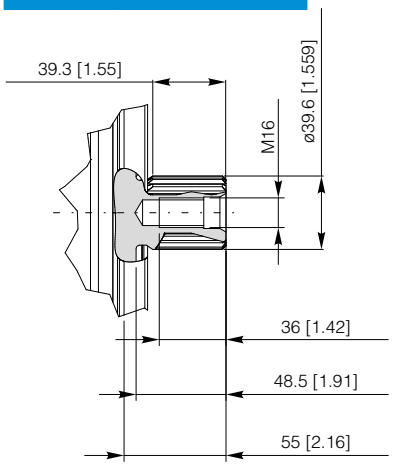
13T 8/16" DP - ANSI B92.1a - 1976 FLAT ROOT

BI Splined



W45x2x30x21 DIN 5480

BL Splined

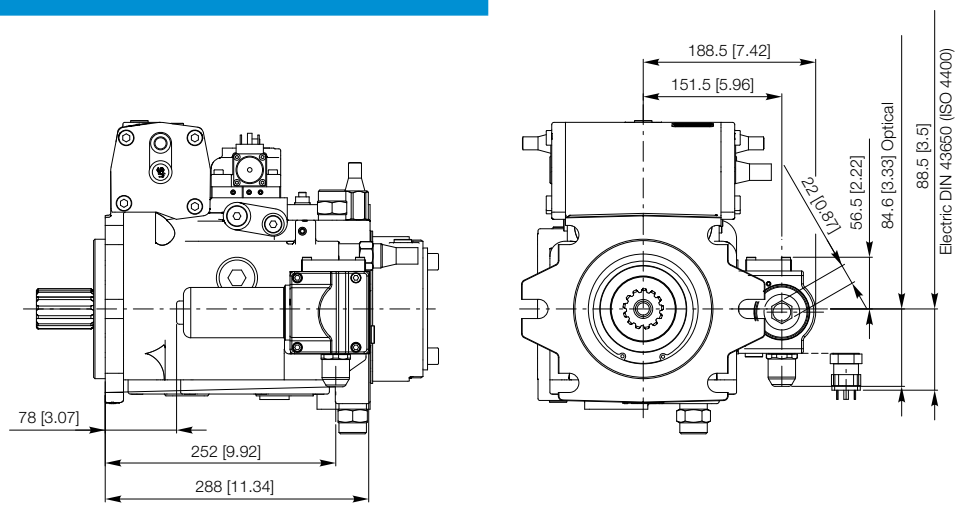


W40x2x30x18 DIN 5480

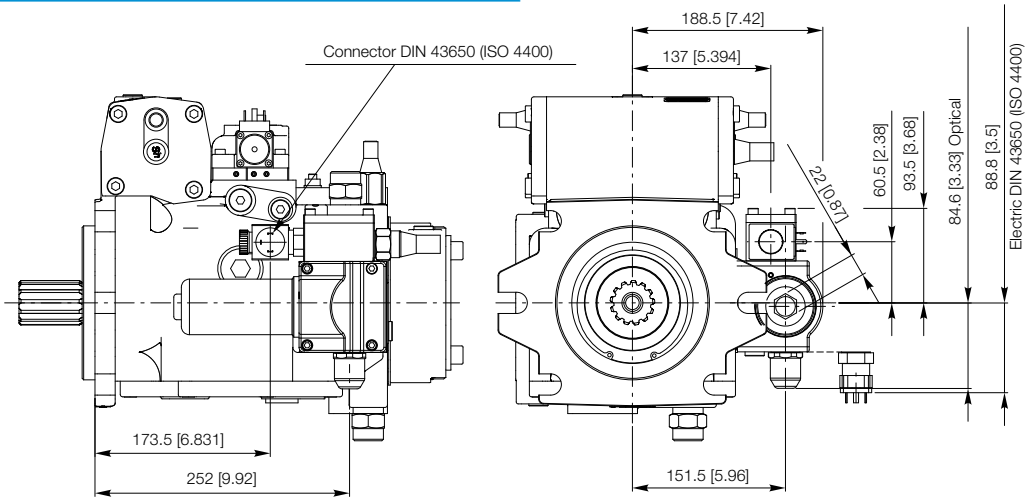
S6CV 128 - Pump and accessories dimensions

16 + 18 Pressure compensator and Cut-Off + Filter

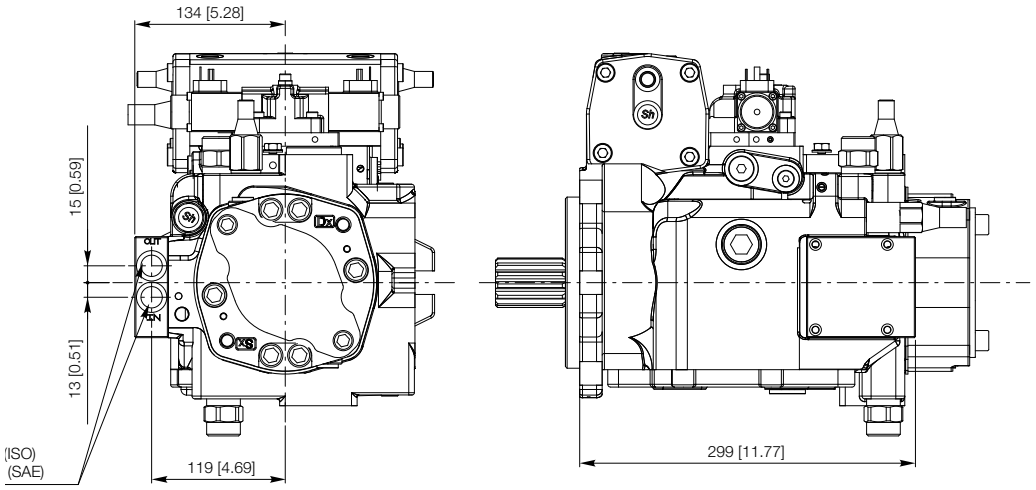
Filter



TE-EP Filter + Electric Cut-Off valve

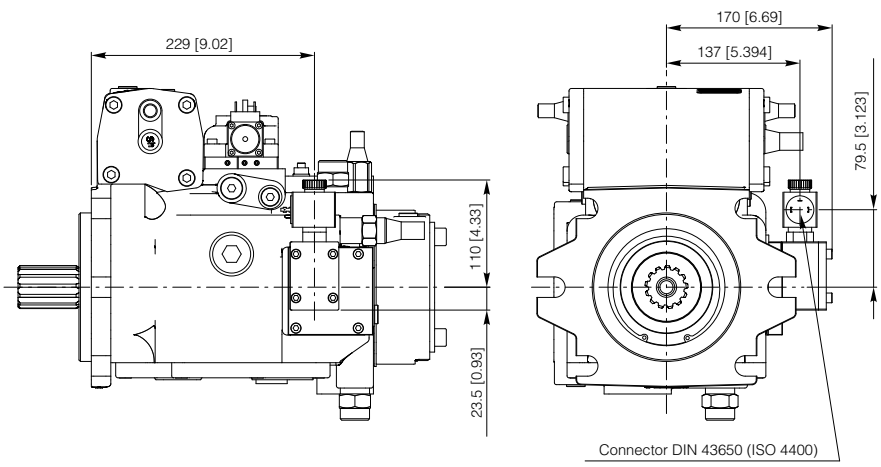


FR Remote filter



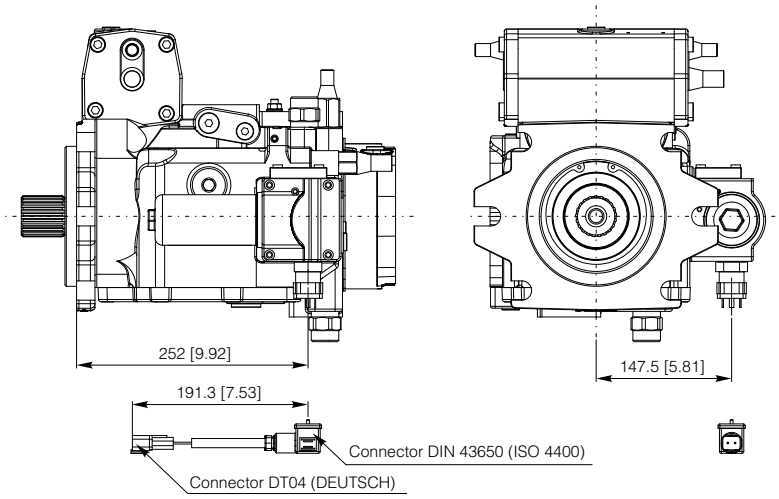
16 Pressure compensator and Cut-Off

TE Electric Cut-Off



21 Pump feature

DT4 Conversion cable from DIN43650 / ISO4400 to Deutsch DT04 connector (DT4)



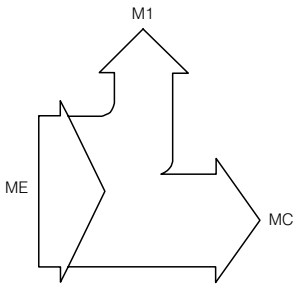
S6CV 128 - Throught drives

S6CV 128 pump can be supplied with through drive. The through drive can driving with a second S6CV or a pump of other kind.

Available flanges are:
Standard G2 and G3 gear pump flange
SAE A, SAE B, SAE C, SAE B-B and SAE C-C and SAE-D flange
TANDEM flange

The maximum permissible torques on drive shaft of the first pump and the maximum through drive torques are listed in the table below.

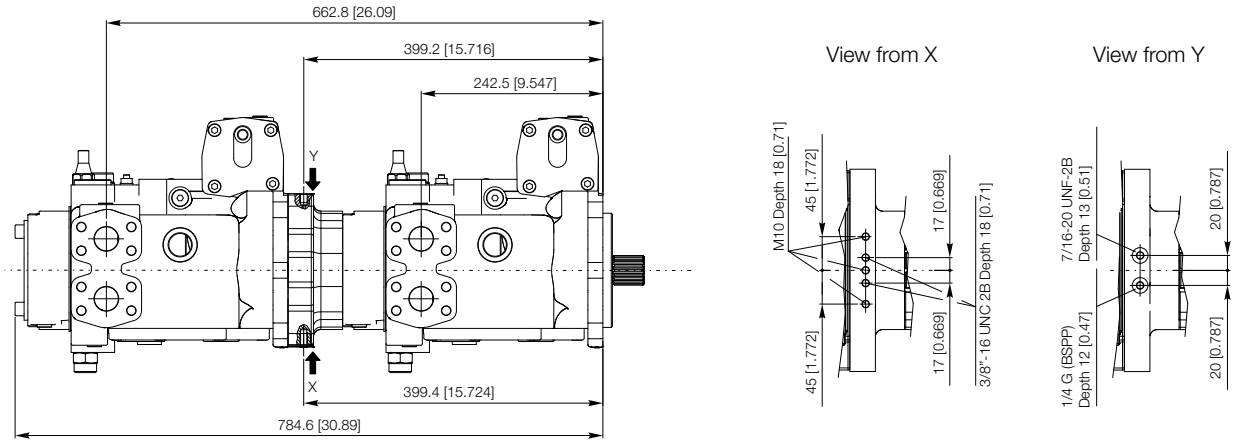
WARNING:
The effective torque value on the shaft of first pump is given by the sum of the torques required from each pump making the system.



Drive shaft			**BE** (Z27 16/32 DP)	**BF** (Z23 16/32 DP)	**BG** (Z15 8/16 DP)	**BH** (Z13 8/16 DP)	**BI** (W45x2x30x21)	**BL** (W40x2x30x18)
Drive shaft max torque	ME	Nm [lbf·ft]	1900 [1400]	1250 [921]	2670 [1967]	1640 [1208]	2190 [1614]	1460 [1076]
Through drive max torque	MC	Nm [lbf·ft]	1000 [737]	1000 [737]	1000 [737]	1000 [737]	1000 [737]	1000 [737]

19 Throught drive

S6CV 128 + S6CV 128 Tandem



Shafts for combination pumps

	Configuration 128/128	
Pump	1st.	2nd.
Shaft	**BF**	**BF-BH**
Shaft	**BE**	**BF-BH**
Shaft	**BG**	**BF-BH**
Shaft	**BH**	**BF-BH**
Shaft	**BI**	**BF-BH**
Shaft	**BL**	**BF-BH**

Warning:
The TA-TB-TZ-TY-BT-TC-CT-TD-TJ through drives must be used in the configuration of the first pump in the following cases:

1. Tandem pump combination.
2. Single pump for possible Tandem pump combination with Dana second pump.

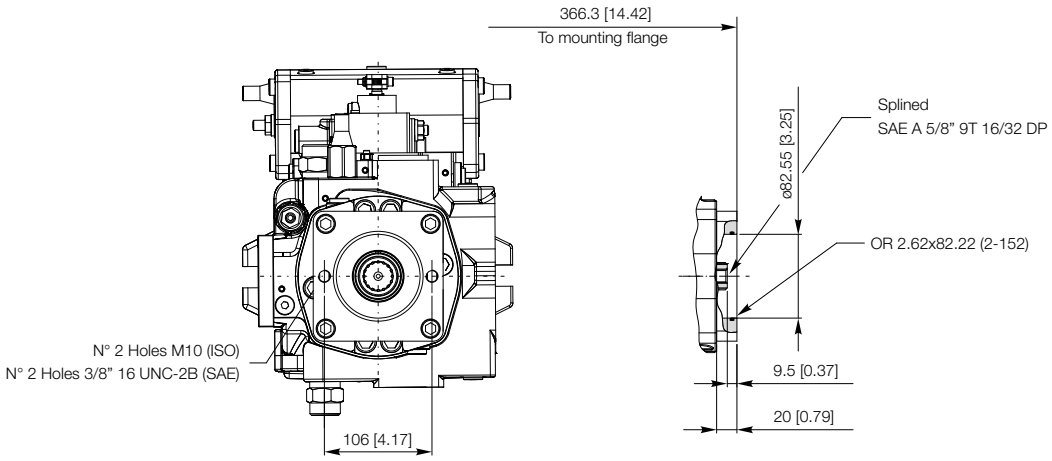
Example:

- If it is needed to purchase a Tandem pump combination with two S6CV 128 pumps and the second pump has the BF (23T - 16/32 DP) shaft, the first pump will must have the TJ through drive.
- If it is needed to purchase a single S6CV 128 pump for Tandem pump combination with a second pump has the BH (13T - 8/16 DP) shaft, the pump will must have the TD through drive.

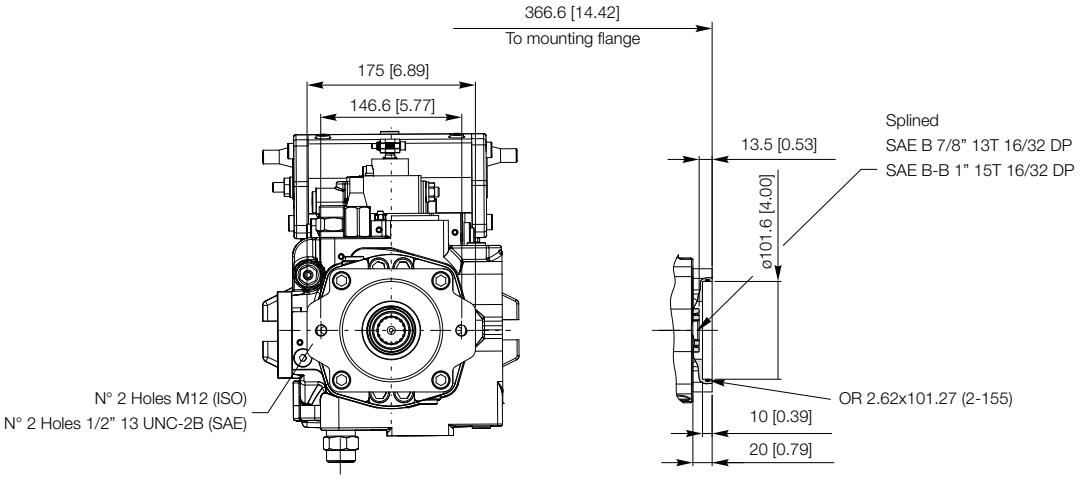
S6CV 128 - Throught drives dimensions

19 Throught drive

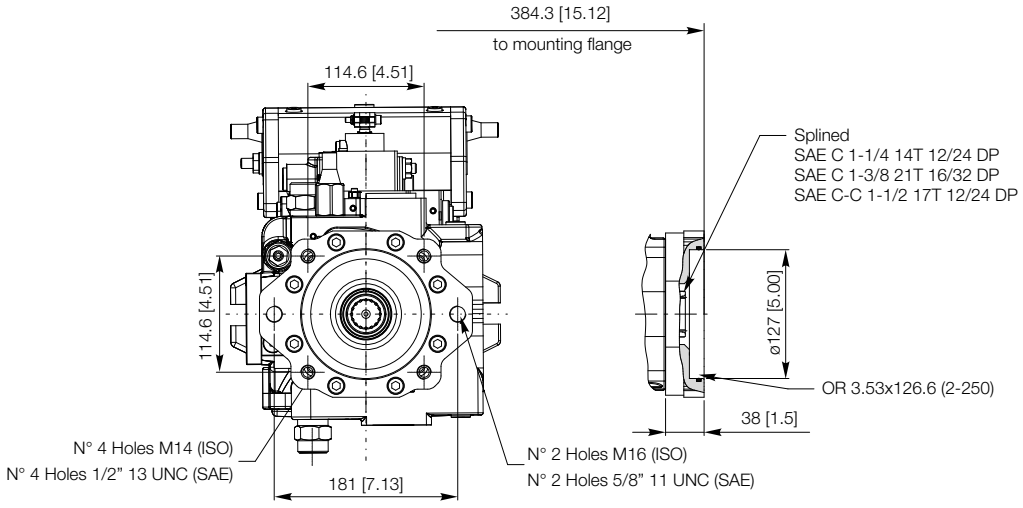
SA SAE A flange



SB/BB SAE B / SAE B-B flange

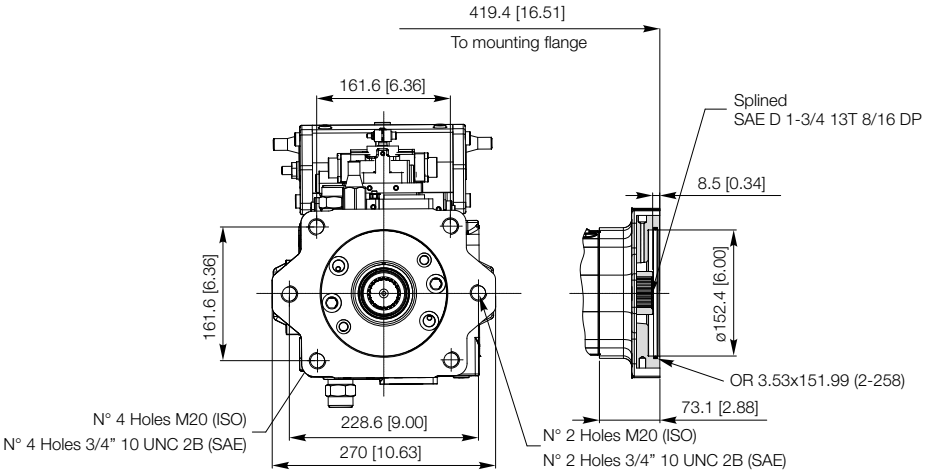


SC-S5/CC SAE C / SAE C-C flange

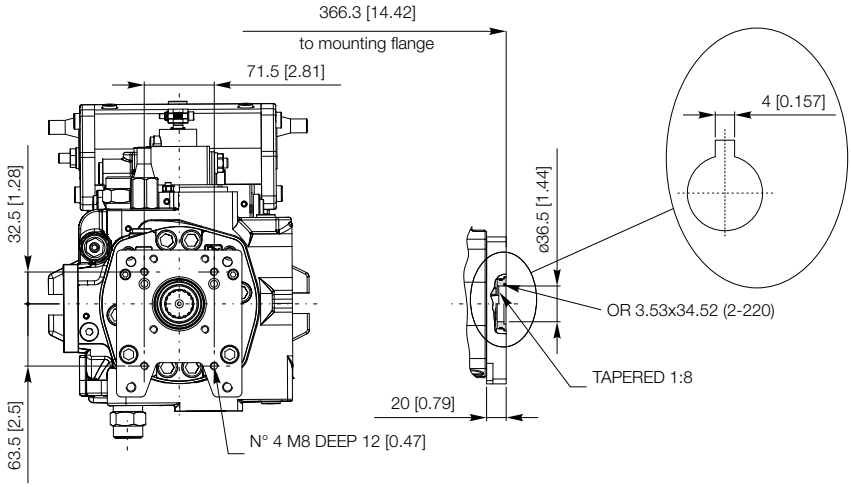


19 Throught drive

SD SAE D flange



G2 G2 flange



G3 G3 flange