



101 series



102 series



103 series

PV series



FZ series

**Hydraulic Steering
Control Unit &
Accessories Catalog**

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MODEL BZZ HYDRAULIC STEERING CONTROL UNITS (SCU)



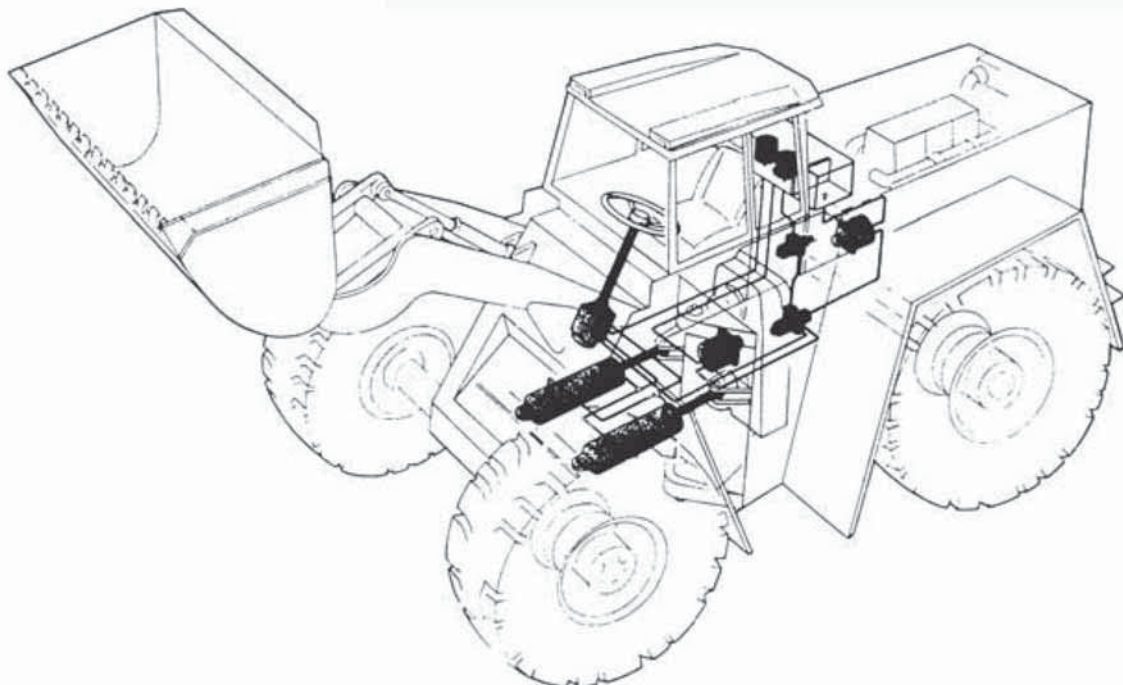
SCU can be used in the area of steering of vehicle and hydraulic rudder of ships where the operator can use it to control power steering force with light operating force. it is safe, reliable and smooth in the function and operation.

MODEL BZZ1 BZZ2 BZZ3 OFFER THE FOLLOWING ADVANTAGES:

- * Eliminate linkage-reduce cost, provide flexibility in design.
- * Provide operator comfort.
- * Automatically reverts to emergency manual pump in case of engine failure.
- * Provide continuous unlimited control circuits and meter sizes.
- * Can work with many kinds of power steering pumps or fluid supply systems.

MODEL BZZ5 LOAD SENSING STEERING WITH ABOVE ADVANTAGES, ALSO HAS FOLLOWING FEATURES:

- * Provide reliable, smooth pressure compensated steering, because pressure variations in the steering circuit do not affect steering response or maximum steering rate, and the steering circuit always has flow priority.
- * Only the flow required by the steering maneuver goes to the steering circuit. Flow not required for steering is available for use in the auxiliary circuit. Therefore power loss is decreased, system efficiency is increased.

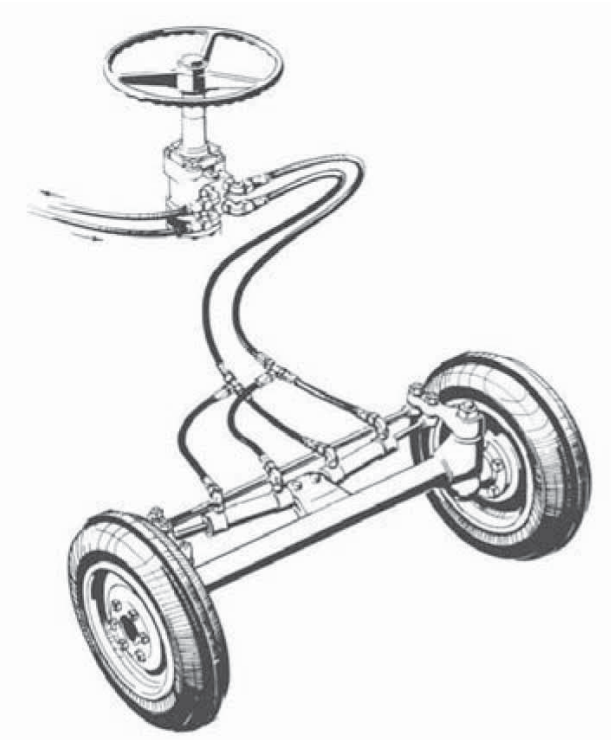


ORDER INFORMATION

BZZ		E				
						DESIGN CODE
						DISPLACEMENT ML/R
						PRESSURE GRADE 16MPA
						MODEL SERIES

MOUNTING TYPE	A	A: LONG RINGED BOSS,CROSS-BLOCK CONNECTION
	B	SAE INVOLUTE SPLINE CONNECTION
	C	SHORT RINGED BOSS,CROSS-BLOCK CONNECTION

FUNCTION CODE	1	OPEN CENTER NON LOAD REACTION
	2	OPEN CENTER LOAD REACTION
	3	CLOSED CENTER NON LOAD REACTION
	5	LOAD SENSING



BZZ

GENERAL DESCRIPTION

MODEL BZZ FUNCTION

The steering unit consists of a rotary valve and a rotary meter. Via a steering column the steering unit is connected to the steering wheel of vehicle. When the steering wheel is turned, oil is directed from the steering system pump via the rotary valve (spool and sleeve) and rotary meter (Gerotor/Geroler gear set) to the cylinder ports L or R (depend on the direction of turn). The rotary meter meters the oil flow to the steering cylinder in proportion to the angular rotation of the steering wheel. If the oil flow from the steering system pump is too small, the steering unit can function as a manual pump.

IN OPEN CENTER SYSTEM

Released the wheel of steering, pump and tank are connected in open circuit when the rotary valve of steering unit is in the neutral position. Normally uses a fixed displacement pump.

IN CLOSED CENTER SYSTEM

Released the wheel of steering, pump and tank are disconnected in closed circuit when the rotary valve of steering unit is in the neutral position. Normally uses a pressure compensated variable displacement pump.

TECHNICAL REQUIREMENT FOR STEERING COLUMN

While the steering column is connected to the steering unit, this will eliminate any axial or radial forces applied to the SCU. The SCU will automatically return to neutral position after one complete work cycle.

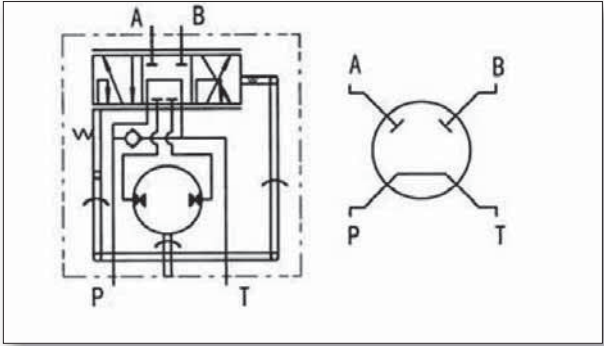
OPERATION GUIDE OF STEERING COLUMN

Under normal operating, the steering pump supplies an adequate oil flow in dynamic units. The maximum torque on steering wheel will not exceed $5N \cdot m$. If the oil flow from the steering system pump fails or is too small, the steering unit can function automatically as a manual steering pump. Under manual steering, the input torque of steering wheel will exceed $5N \cdot m$ obviously. If torque exceeds $120N \cdot m$, some of parts of steering unit will be damaged inside.

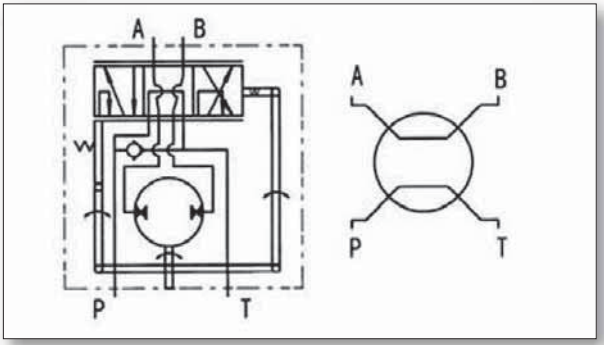
BZZ1-BZZ2-BZZ3

FUNCTION CODE

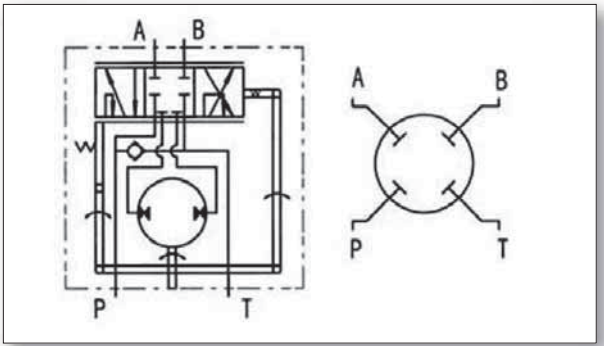
BZZ1 Open center non load reaction



BZZ2 Open center load reaction



BZZ3 Closed center non load reaction



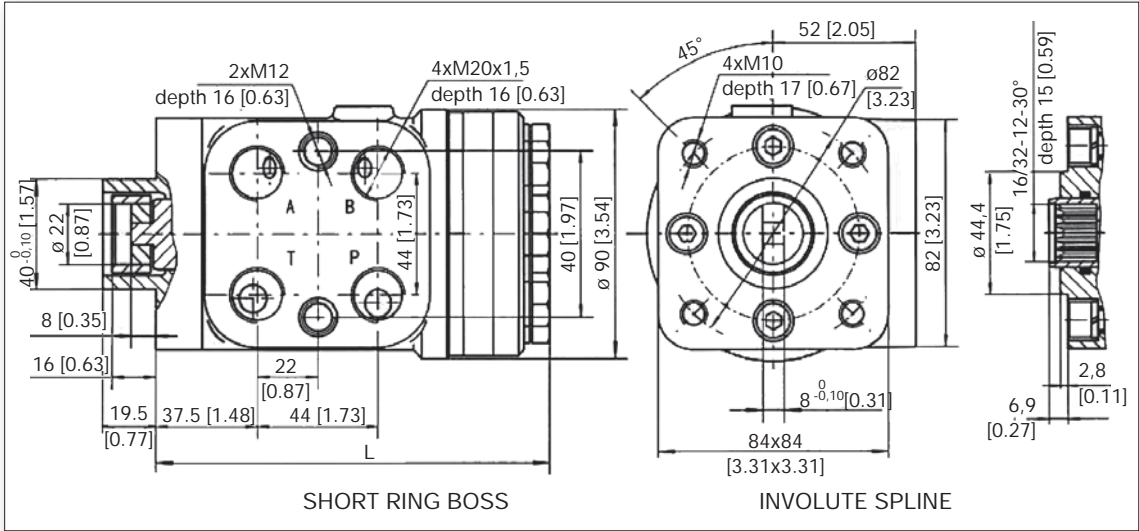
BZZ1-BZZ2-BZZ3
MAIN SPECIFICATION

MAIN SPECIFICATION								
MODEL	Displacement		Flow		Max.input pressure	Max. cont. back pressure	Weight	
	mL/r	in ³ /rev	L/min	gpm			kg	lbs
BZZ1 - 2 - 3 -E50 *	50	3.0	4	1.06	16 MPa 2320 PSI	25 MPa 3625 PSI	4.72	10.38
BZZ1 - 2 - 3 -E63 *	63	3.8	5	1.30			4.85	10.47
BZZ1 - 2 - 3 -E80 *	80	4.9	6	1.60			5.0	11.00
BZZ1 - 2 - 3 -E100 *	100	6.1	7.5	1.98			5.27	11.59
BZZ1 - 2 - 3 -E125 *	125	7.6	9.5	2.50			5.43	11.95
BZZ1 - 2 - 3 -E160 *	160	9.8	12	3.20			5.75	12.65
BZZ1 - 2 - 3 -E200 *	200	12.2	15	3.96			6.08	13.31
BZZ1 - 3 -E250 *	250	15.2	19	5.55			6.48	14.00
BZZ1 - 3 -E280 *	280	17.1	21	5.60			6.78	14.92
BZZ1 - 3 -E315 *	315	19.2	24	6.30			7.13	15.69
BZZ1 - 3 -E400 *	400	24.4	30	7.93			7.78	17.12
BZZ1 - 3 -E500 *	500	30.5	38	10.04			8.67	19.07
BZZ1 - 3 -E630 *	630	38.4	48	12.68			9.72	21.38
BZZ1 - 3 -E800 *	800	48.8	60	15.85			11.18	24.60
BZZ1 - 3 -E1000 *	1000	61.0	75	19.81	12.8	28.16		

Main Specification Of Low-input Torque Hydraulic Steering Control Units									
MODEL	Displacement		Flow		Max.input pressure	Max. cont. back pressure	Input torque (N•m)	Weight	
	mL/r	in ³ /rev	L/min	gal/min				kg	lbs
BZZ1 - 2 - 3 -E50 * A	50	3.0	4	1.06	16 MPa 2320 PSI	25 MPa 3625 PSI	≤ 2.4	4.72	10.38
BZZ1 - 2 - 3 -E63 * A	63	3.8	5	1.30				4.85	10.47
BZZ1 - 2 - 3 -E80 * A	80	4.9	6	1.60				5.0	11.00
BZZ1 - 2 - 3 -E100 * A	100	6.1	7.5	1.98				5.27	11.59
BZZ1 - 2 - 3 -E125 * A	125	7.6	9.5	2.50				5.43	11.95
BZZ1 - 2 - 3 -E160 * A	160	9.8	12	3.20				5.75	12.65
BZZ1 - 2 - 3 -E200 * A	200	12.2	15	3.96				6.08	13.31
BZZ1 - 3 -E250 * A	250	15.2	19	5.55				6.48	14.00
BZZ1 - 3 -E280 * A	280	17.1	21	5.60				6.78	14.92
BZZ1 - 3 -E315 * A	315	19.2	24	6.30				7.13	15.69
BZZ1 - 3 -E400 * A	400	24.4	30	7.93				7.78	17.12

BZZ1-BZZ2-BZZ3

MOUNTING DATA



Note: Above is for short ringed boss connection dimension. When dimension is 18, 25, 30.5 instead of 9,16,19.5 long ringed boss connection is available for reference above.

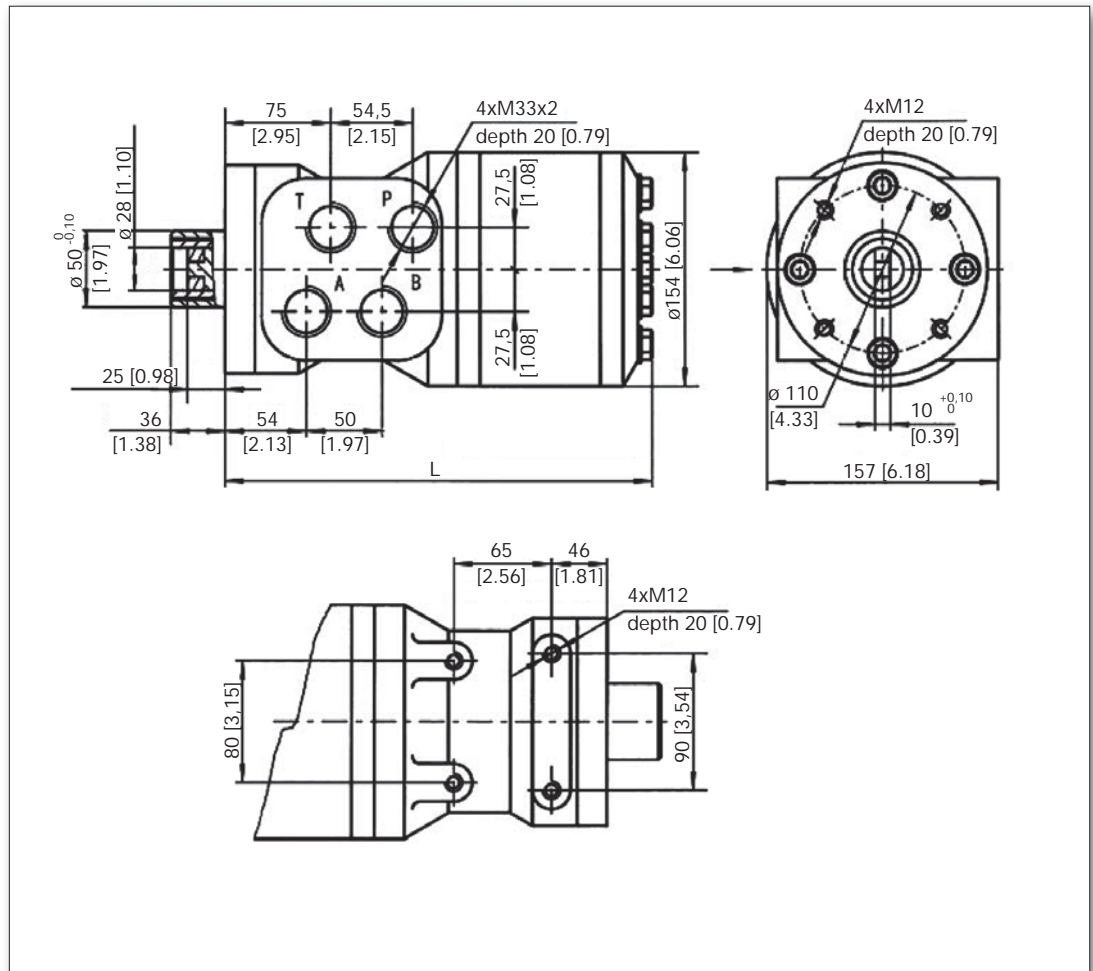
MODEL	Length L	
	mm	inches
BZZ1 - 2 - 3 -E50 *	140	5.51
BZZ1 - 2 - 3 -E63 *	141	5.51
BZZ1 - 2 - 3 -E80 *	142.5	5.61
BZZ1 - 2 - 3 -E100 *	145	5.71
BZZ1 - 2 - 3 -E125 *	148	5.83
BZZ1 - 2 - 3 -E160 *	153	6.02
BZZ1 - 2 - 3 -E200 *	158	6.22
BZZ1 - 3 -E250 *	164	6.46
BZZ1 - 3 -E280 *	169	,65
BZZ1 - 3 -E315 *	174	6.85
BZZ1 - 3 -E400 *	184	7.24
BZZ1 - 3 -E500 *	197	7.76
BZZ1 - 3 -E630 *	216	8.50
BZZ1 - 3 -E800 *	236	9.29
BZZ1 - 3 -E1000 *	262	10.31

BZZ1-BZZ3

MAIN SPECIFICATION

MODEL	Displacement		Flow		Max.input pressure	Max. cont. back pressure	Weight	
	(mL/r)	in ³ /rev	(L/min)	gpm			(kg)	lbs
BZZ 1 - 3 -E1000	1000	61.0	60	15.9	16 MPa 2320 PSI	2,5 MPa 363 PSI	24.5	54.0
BZZ 1 - 3 -E1250	1250	76.3	75	19.8			25.5	56.2
BZZ 1 - 3 -E1600	1600	97.6	96	25.4			27.5	60.6
BZZ 1 - 3 -E2000	2000	122.0	120	31.7			28.5	62.8
BZZ 1 - 3 -E2500	2500	152.6	150	39.7			30	66.1

MOUNTING DATA



MODEL	Length L	
	(mm)	inches
BZZ 1 - 3 -E1000	249	9.80
BZZ 1 - 3 -E1250	261.5	10.30
BZZ 1 - 3 -E1600	279	10.98
BZZ 1 - 3 -E2000	299	11.77
BZZ 1 - 3 -E2500	324	12.76

BZZ5

MAIN SPECIFICATION

In load sensing steering systems, the oil for steering system and the working circuit may be supplied by a pump via a priority valve of which can support extra amount of oil into operating system. In addition when using a Load sense pump energy is saved.

The Ls inlet of the load sensing steering unit is connected to a priority valve or the Ls inlet of the load sense pump via a pressure line. The recommended length is less than 2m.

The pressure signal of the steering load is transferred to the Priority valve or Ls inlet of the pump to control the oil volume that is supplied to the SCU.

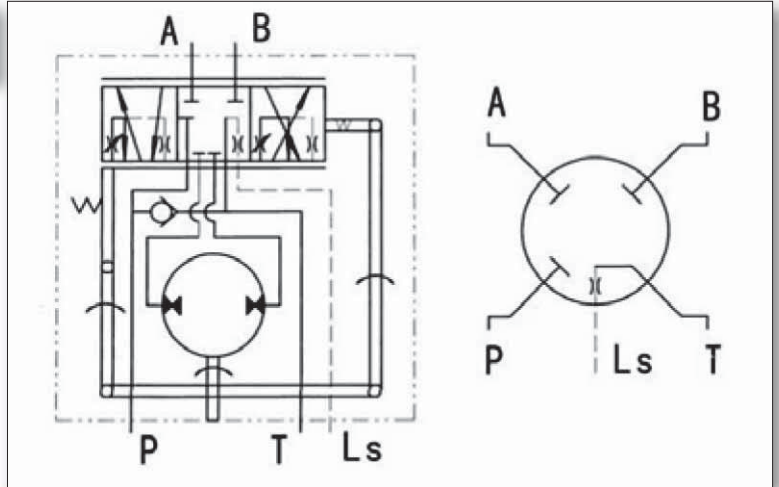
In the neutral position of load sensing steering unit, less than 2L/min of system oil is directed back to the tank.

MODEL	Displacement		Max Input Speed	Max. input pressure	Max. cont. back pressure	Max Power Steering Torque
	mL/r	in ³ /rev	(rpm)			
BZZ5-E 80	B C	80	4.88	16 MPa 23.20 PSI	1,6 MPa 2.32 PSI	≤ 5 N•m 44 in/lbs
BZZ5-E 100	B C	100	6.10			
BZZ5-E 125	B C	125	7.60			
BZZ5-E 160	B C	160	9.80			
BZZ5-E 200	B C	200	12.20			
BZZ5-E 250	B C	250	15.30			
BZZ5-E 315	B C	315	19.20	75		
BZZ5-E 400	B C	400	24.40			
BZZ5-E 500	B C	500	30.50	60		
BZZ5-E 630	B C	630	38.50			
BZZ5-E 800	B C	800	48.80			
BZZ5-E 1000	B C	1000	61.00			

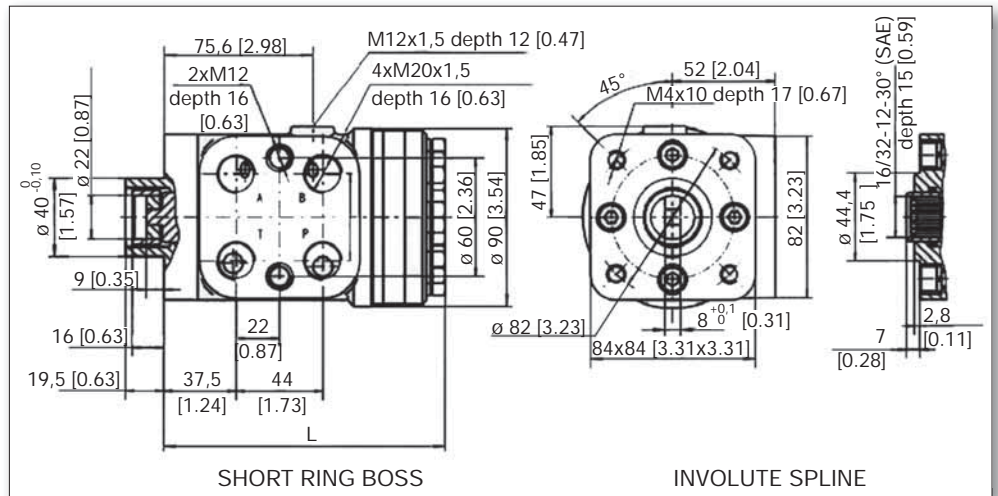
BZZ5

FUNCTION CODE

LOAD SENSING



MOUNTING DATA



MODEL	Length L	
	(mm)	inches
BZZ 5-E80*	142.5	5.61
BZZ 5-E100*	145	5.71
BZZ 5-E125*	148	5.83
BZZ 5-E160*	153	6.02
BZZ 5-E200*	158	6.22
BZZ 5-E250*	164	6.46

MODEL	Length L	
	(mm)	inches
BZZ 5-E315*	174	6.85
BZZ 5-E400*	184	7.24
BZZ 5-E500*	197	7.76
BZZ 5-E630*	216	8.50
BZZ 5-E800*	236	9.29
BZZ 5-E1000*	262	10.31

SERIES 101-1,2,3 HYDRAULIC STEERING CONTROL UNITS (SCU)

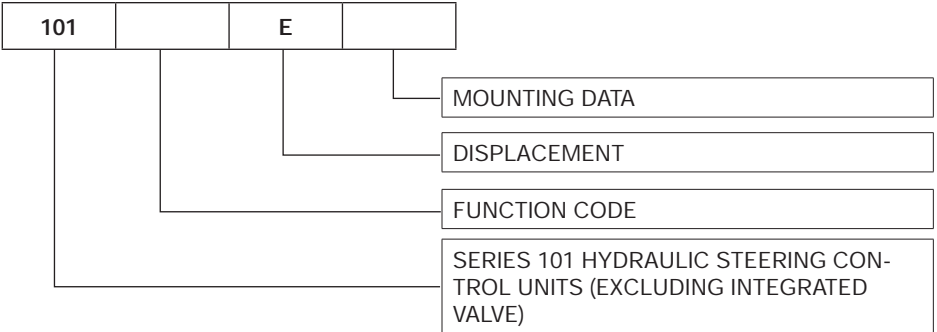
101-1,2,3



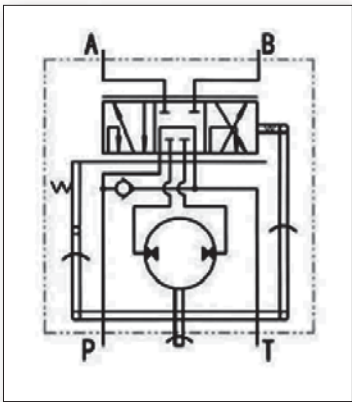
MAIN SPECIFICATION

Hydraulic steering control unit (SCU) series 101-1,2,3 has a compact structure. Its mounting data is in line with the international standard. SCU series 101-1,2,3 is widely used in the steering control system of the low speed vehicles, such as forklift, tractor, combine harvester, construction machinery, road building machinery, marine rudder, etc. It can obtain more output steering force by inputting less force, this kind of steering is smooth, flexible and reliable in operation.

ORDER CODE

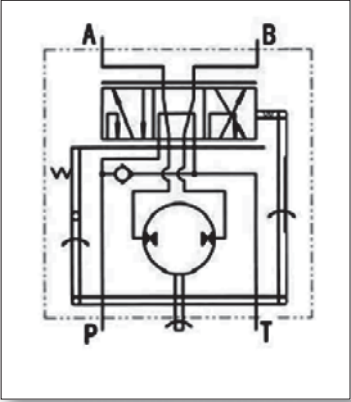


FUNCTION CODE



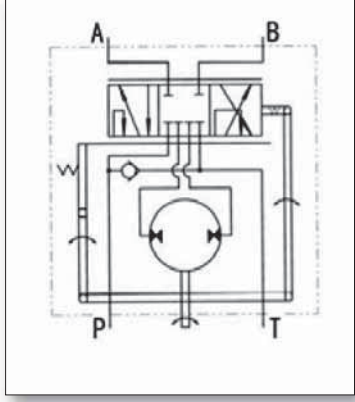
101-1

Open Center
Non Load Reaction



101-2

Open Center
Load Reaction



101-3

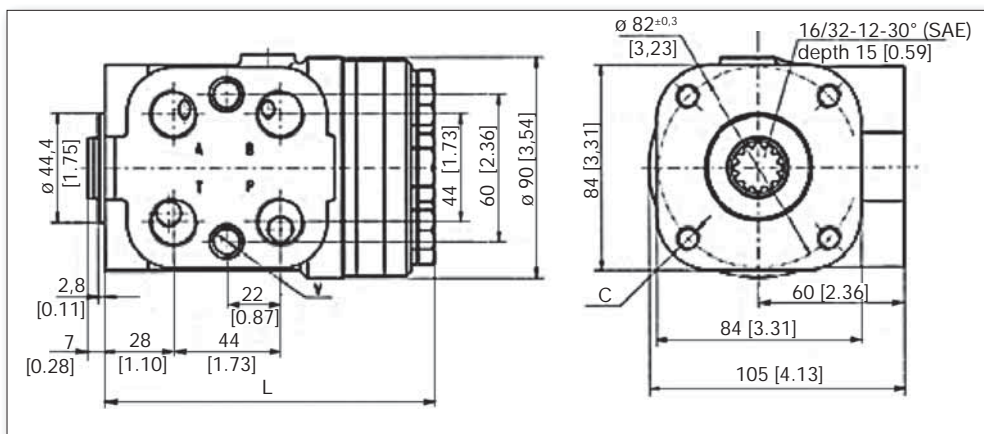
Closed Center
Non Load Reaction

101-1,2,3

MAIN SPECIFICATION

PARAMETERS		Model										
		101										
Function Code		1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1	1	1	1
Displacement	(mL/r)	50	63	80	100	125	160	200	250	280	315	400
	in ³ /r	3.05	3.84	4.88	6.10	7.63	9.76	12.20	15.25	19.08	19.22	24.41
Rated flow	(L/min)	5	6	8	10	12.5	16	20	25	28	32	40
	gal/min	1.32	1.66	2.11	2.64	3.30	4.22	5.28	6.60	7.40	8.45	10.5
Max. input pressure	(MPa)	16										
	PSI	2320										
Max. cont. back pressure	(MPa)	2.5										
	PSI	362										
Weight	kg	5.70	5.76	5.84	5.91	6.05	6.25	6.45	6.68	6.86	7.06	7.45
	lbs	12.57	12.70	12.87	13.03	13.34	13.78	14.22	14.78	15.12	15.56	16.45
Dimension L	mm	130	132	134	137	140	145	150	156	161	166	176
	inches	5.14	5.20	5.28	5.39	5.51	5.71	5.91	6.14	6.34	6.54	6.93

MOUNTING DATA

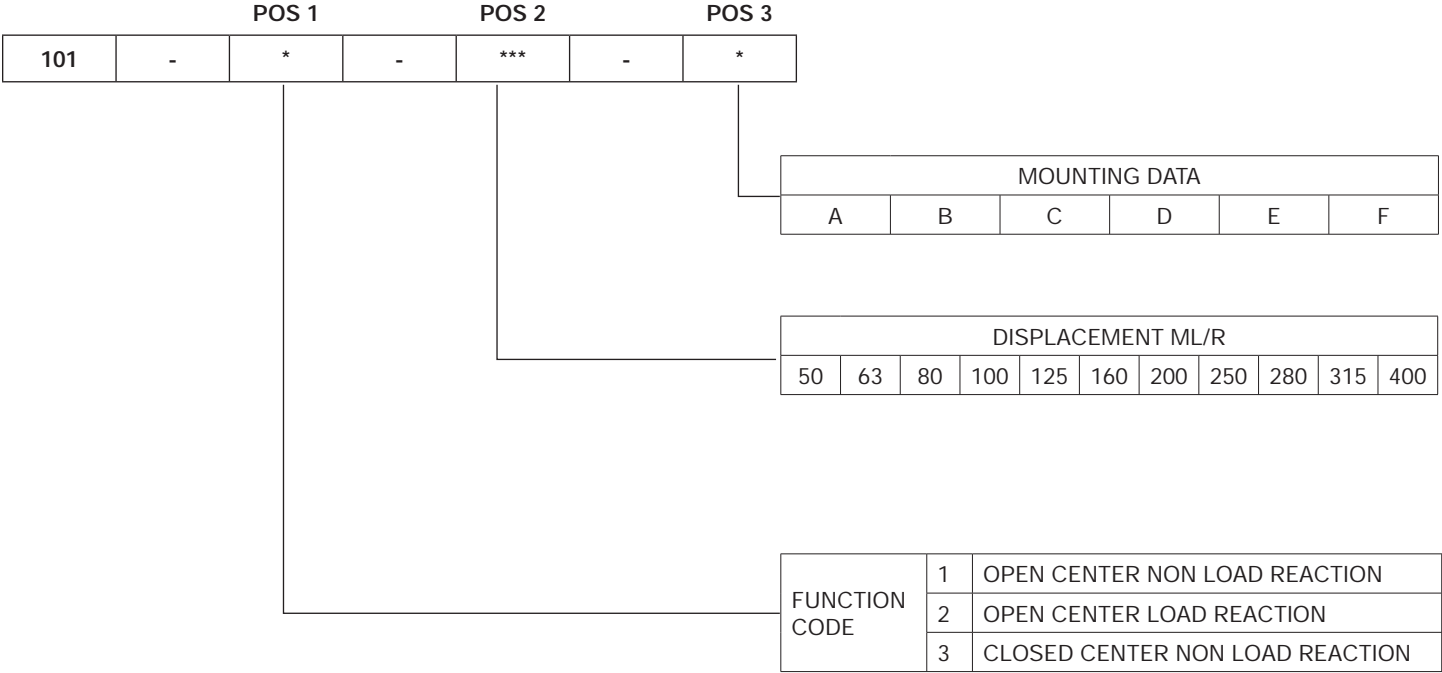


PORTS THREADS

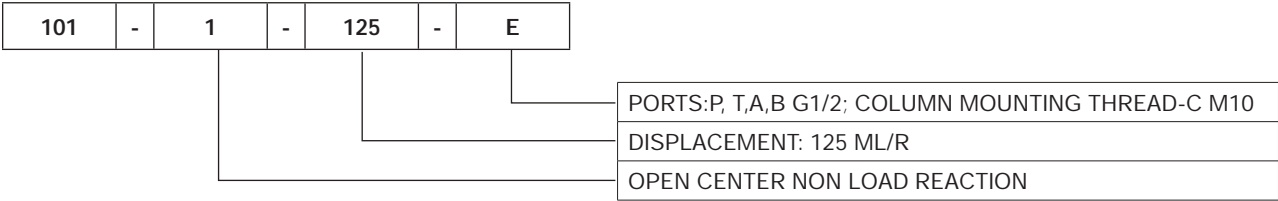
CODE	PORTS P, T, A, B		COLUMN MOUNTING C		VALVE MOUNTING V	
	Thread	Depth	Thread	Depth	Thread	Depth
A	M20X1.5	14 mm 0.55 in	M10	16 mm 0.63 in	M12	16 mm 0.63 in
B	M20X1.5 O-RING					
C	M18X1.5					
D	M18X1.5 O-RING					
E	G1/2				M10X1	3/8-24 UNF
F	3/4-16UNF O-RING					

101-1,2,3

ORDER CODE



FOR EXAMPLE:

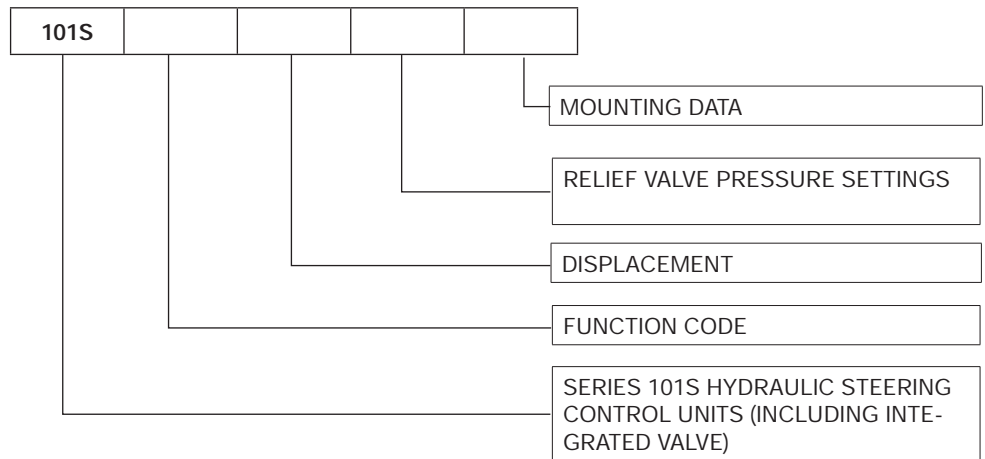


101S-1,2,4

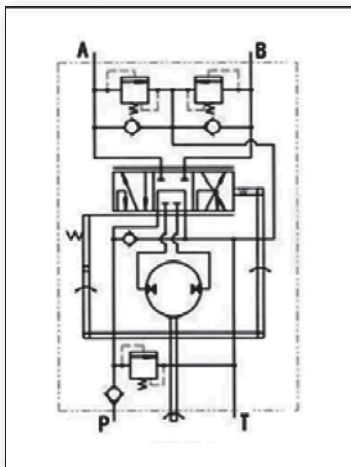
MAIN SPECIFICATION

SCU series 101S-1,2,4 inherits the steering function of series 101 both in the structure and in the principle. The feature of series 101S is to have the following valves functions incorporated inside one housing as follows: the relief valve, the shock valve, the suction valve and the check valve according to the different requirement upon the base of the series 101. This kind of structure is more compact, and it's more convenient in operation.

ORDER CODE

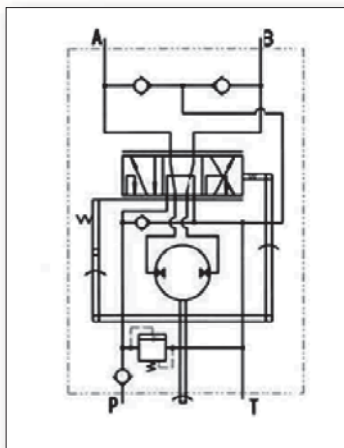


FUNCTION CODE



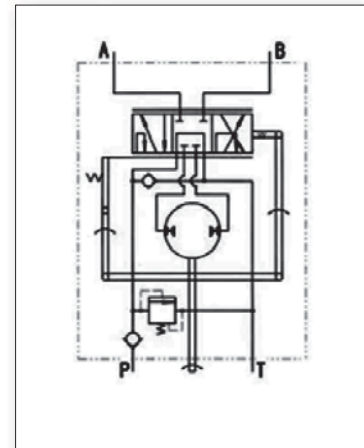
101S-1

Open Center
Non Load Reaction



101S-2

Open Center
Load Reaction



101S-4

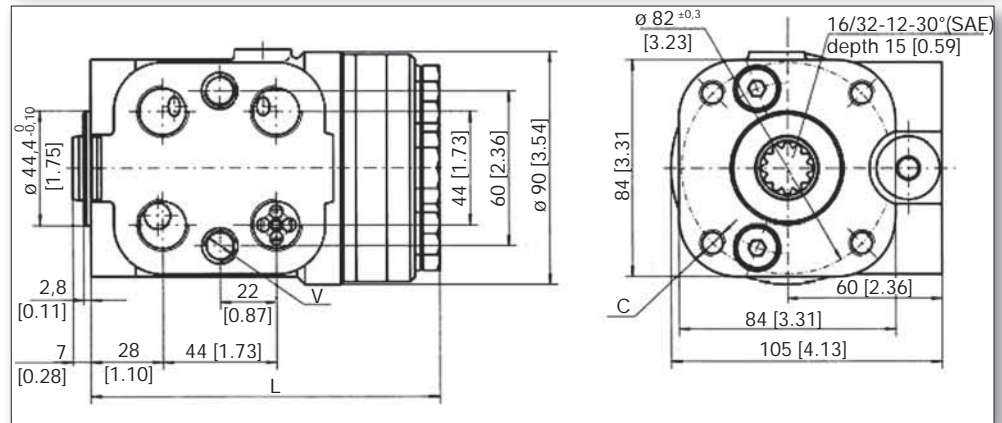
Open Center
Non Load Reaction

101S-1,2,4

MAIN SPECIFICATION

PARAMETERS		Model										
		101S										
Function Code		1,2,4	1,2,4	1,2,4	1,2,4	1,2,4	1,2,4	1,2,4	1,4	1,4	1,4	1,4
Displacement	(mL/r)	50	63	80	100	125	160	200	250	280	315	400
	in ³ /r	3.05	3.84	4.88	6.10	7.63	9.76	12.20	15.25	17.08	19.22	24.41
Rated flow	(L/min)	5	6	8	10	12.5	16.0	20.0	25.0	28.0	32.0	40.0
	gal/min	1.32	1.66	2.11	2.64	3.30	4.22	5.28	6.60	7.40	8.45	10.5
Max. input pressure	(MPa)	16										
	PSI	2320										
Relief Valve Pressure Settings	(MPa)	06	07	08	10	12	14	15	16			
	PSI	870	1015	1160	1450	1740	2030	2175	2320			
Shockproof Valve Pressure Settings	(MPa)	12	13	14	16	18	20	21	22			
	PSI	1740	1885	2030	2320	2610	2900	3045	3190			
Max. cont. back pressure	(MPa)	2,5										
	PSI	362										
Weight	kg	5.75	5.81	5.89	5.96	6.10	6.30	6.50	6.73	6.91	7.10	7.50
	lbs	12.65	12.78	12.96	13.11	13.42	13.86	14.30	14.81	15.20	15.62	16.50
Dimension L	mm	130	132	134	137	140	145	150	156	161	166	176
	inches	5.12	5.20	5.28	5.39	5.51	5.71	5.91	6.14	6.34	6.54	6.93

MOUNTING DATA



PORTS THREADS

CODE	PORTS P, T, A, B		COLUMN MOUNTING C		VALVE MOUNTING V	
	Thread	Depth	Thread	Depth	Thread	Depth
A	M20X1.5	14 mm 0.55 in	M10	16 mm 0.63 in	M12	16 mm 0.63 in
B	M20X1.5 O-RING					
C	M18X1.5					
D	M18X1.5 O-RING					
E	G1/2	3/8-16 UNC	3/8-24 UNF			
F	3/4-16UNF O-RING					

101S-1,2,4

ORDER CODE

	POS 1			POS 2			POS 3		POS 4
101S	-	*	-	***	-	*			

MOUNTING DATA					
A	B	C	D	E	F

INTEGRATED VALVE PARAMETER							
RELIEF VALVE PRESSURE SETTINGS (MPA)							
6	7	8	10	12	14	15	16
SHOCK PROOF VALVE PRESSURE SETTINGS IS 6MPA HIGHER THAN RELIEF VALVE							

DISPLACEMENT ML/R										
50	63	80	100	125	160	200	250	280	315	400

FUNCTION CODE	1	OPEN CENTER NON LOAD REACTION
	2	OPEN CENTER LOAD REACTION
	4	OPEN CENTER NON LOAD REACTION

FOR EXAMPLE:

101S	-	1	-	125	-	10	-	E
------	---	---	---	-----	---	----	---	---

PORTS:P, T,A,B G1/2; COLUMN MOUNTING THREAD-C M10
RELIEF VALVE PRESSURE SETTINGS 10MPA, SHOCKPROOF VALVE PRESSURE SETTINGS 16MPA
DISPLACEMENT: 125 ML/R
OPEN CENTER NON LOAD REACTION

101(S)-5(T)(TE)(L)(E)



SERIES 101(S)-5(T)(TE)(L)(E) HYDRAULIC STEERING CONTROL UNITS (SCU)

SCU series 101S-5 (T) (TE) (L) (E) is used in the load sensing steering system.

SCU series 101S-5, 101S-5L, 101S-5E adopts the modulary connection, it can be used by adopting the modulary connection with the PVF priority valve.

SCU series 101S-5L guides the pressure signal at the Ls connection out of the LL connection, and supplies the pressure signal to the electrical control system.

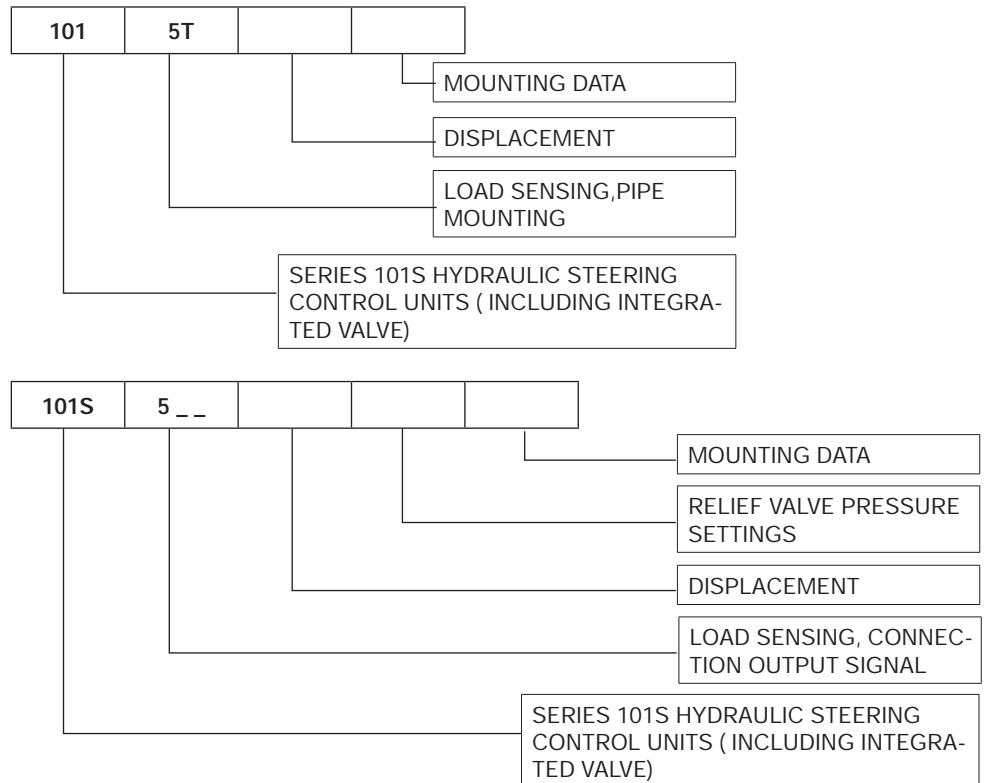
SCU series 101S-5E guides the pressure signal at the port A or B out of the EL connection, and then supplies the pressure signal to the electrical control system.

SCU series 101-S - 5T, 101S-5TE adopts the pipe connection, it can be used after the connection with the PVL priority valve.

SCU series 101-S-5TE guides the pressure signal at the port A or B out of the EL connection, and then supplies the pressure signal to the electrical control system.

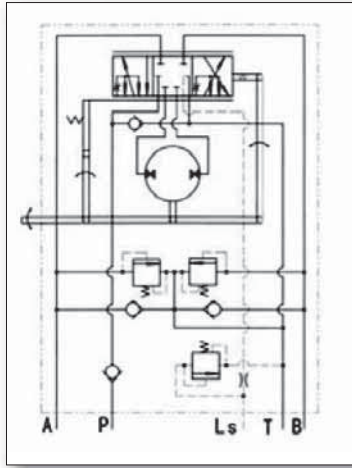
SCU series 101-5T adopts the pipe connection, it can be used only after the pipe connection with the PVL priority valve, and the relief valve is incorporated in the priority valve.

ORDER CODE

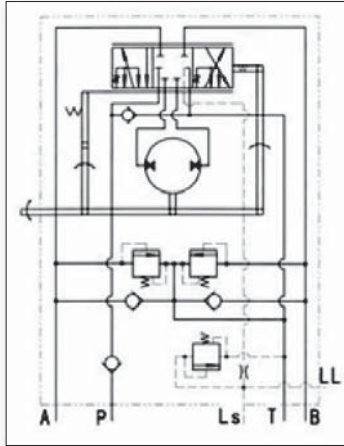


101(S)-5(T)(TE)(L)(E)

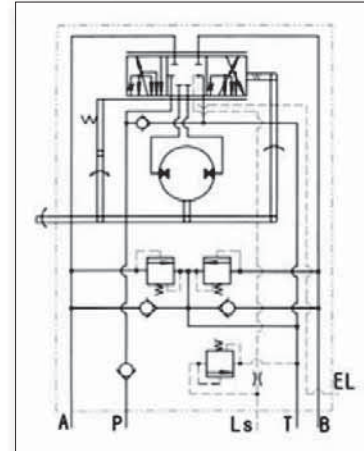
FUNCTION CODE



101S-5

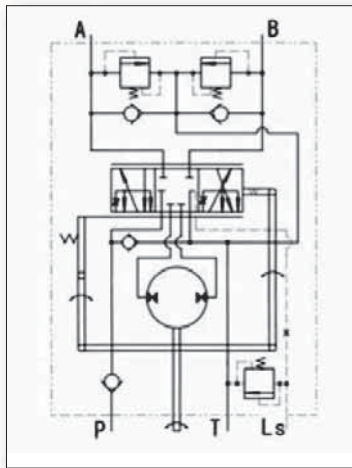


101S-5L

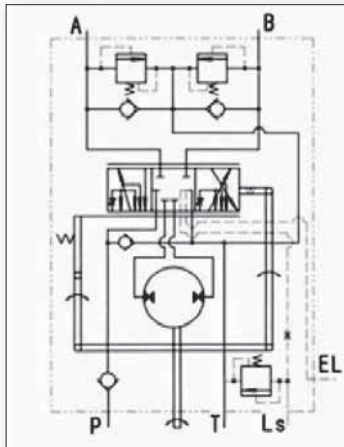


101S-5E

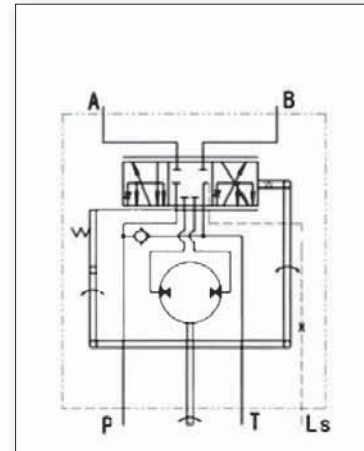
Modulary Mounting



101S-5T



101S-5TE



101-5T

Pipe Mounting

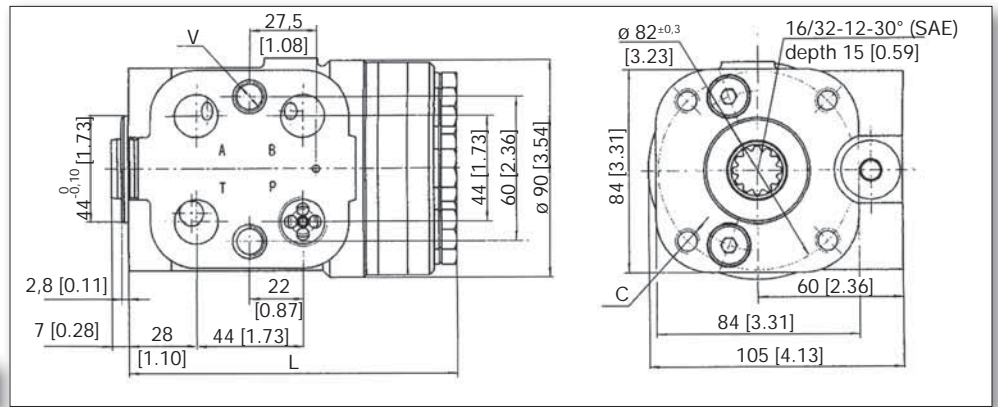
101(S)-5(T)(TE)(L)(E)

MAIN SPECIFICATION

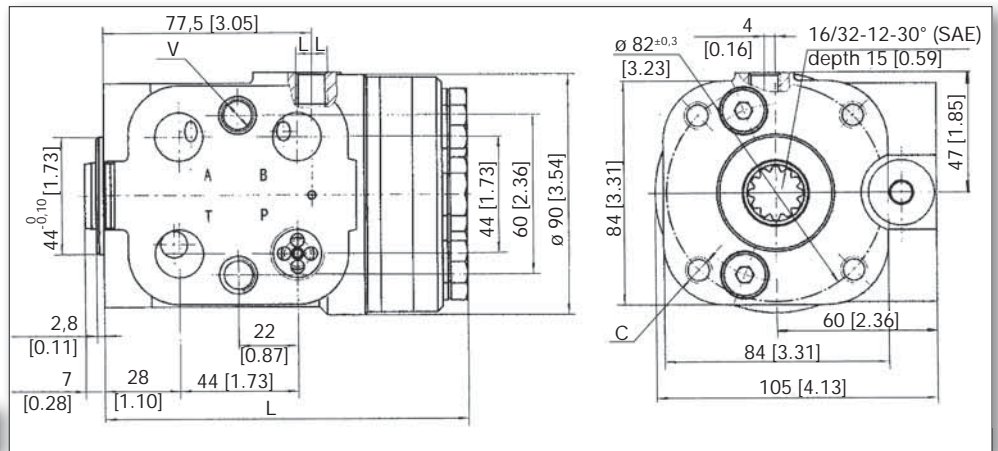
PARAMETERS		Model											
		101-5T-***- * 101S-5(T)(TE)(L)(E)-***-**-*											
Displacement	(mL/r)	50	63	80	100	125	160	200	250	280	315	400	
	in ³ /r	3.05	3.84	4.88	6.10	7.63	9.76	12.20	15.25	17.09	19.22	24.41	
Max. input speed	(rpm)	100							75				
Max. input pressure	(MPa)	16											
	PSI	2320											
Relief Valve Pressure Settings	(MPa)	06	07	08	10	12	14	15	16				
	PSI	870	1015	1160	1450	1740	2030	2175	2320				
Shockproof Valve Pressure Settings	(MPa)	12	13	14	16	18	20	21	22				
	PSI	1740	1885	2030	2320	2610	2900	3045	3190				
Max. cont. back pressure	(MPa)	2,5											
	PSI	362											
Weight	kg	5.75	5.81	5.89	5.96	6.10	6.30	6.50	6.73	6.91	7.10	7.50	
	lbs	12.7	12.8	13.0	13.1	13.4	13.9	14.3	14.8	15.2	15.7	16.5	
Dimension L	mm	130	132	134	137	140	145	150	156	161	166	176	
	inches	5.12	5.20	5.28	5.39	5.51	5.71	5.91	6.14	6.34	6.54	6.93	

MOUNTING DATA

101S-5



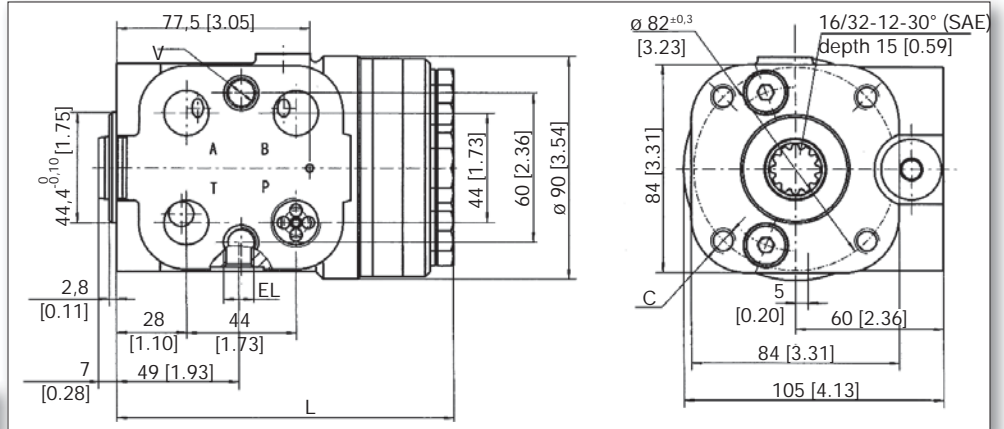
101S-5L



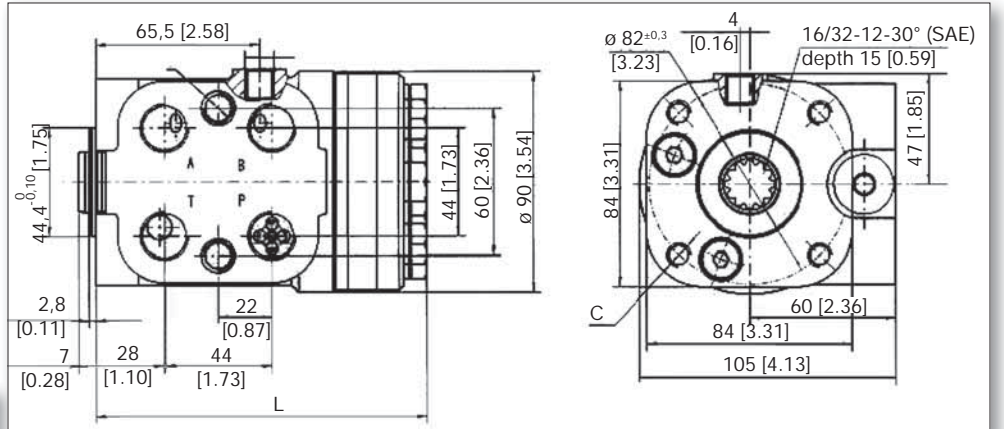
101(S)-5(T)(TE)(L)(E)

MOUNTING DATA

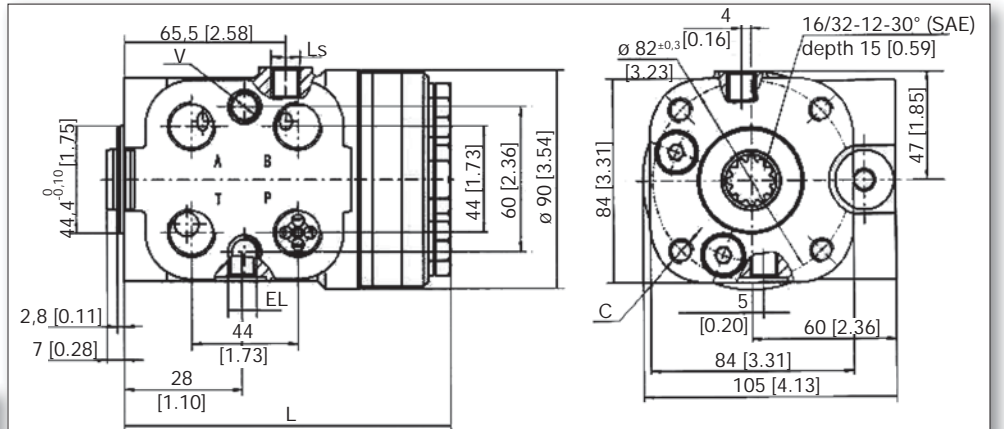
101S-5E



101S-5T

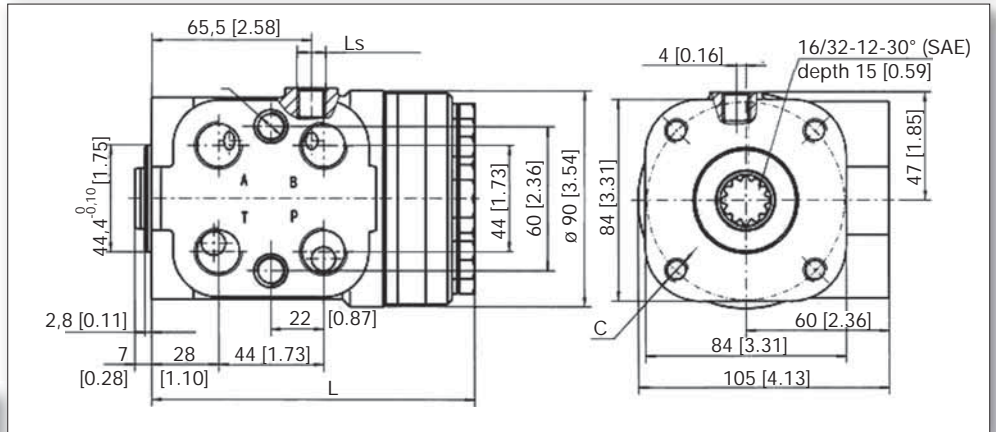


101S-5TE



101(S)-5(T)(TE)(L)(E)

MOUNTING DATA



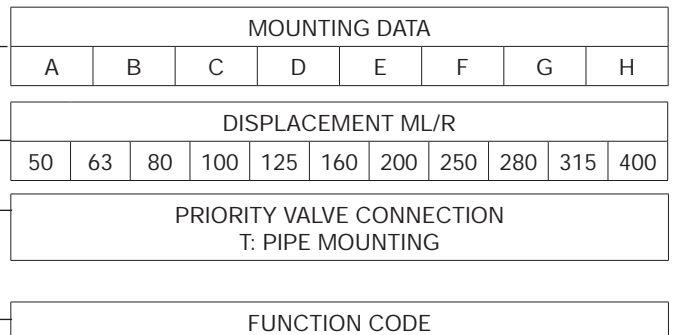
101-5T

PORT THREADS

CODE	PORTS P, T, A, B		COLUMN MOUNTING C		VALVE MOUNTING V		LS PORT		PORTS LL,EL	
	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth	Thread	Depth
A	M20X1.5	14 mm 0.55 in	M10	16 mm 0.63 in	M12	16 mm 0.63 in	M12X1.5	12 mm 0.47 in	M12X1.5	12 mm 0.47 in
B	M20X1.5 O-RING						M12X1.5 O-RING			
C	M18X1.5						M12X1.5			
D	M18X1.5 O-RING						M12X1.5 O-RING			
E	G1/2		3/8-16 UNC	M10X1	0.63 in	3/8-24 UNF	7/16-20UNF O-RING	G1/4	0.47 in	M10X1
F	3/4-16UNF O-RING									7/16-20UNF O-RING
G	Ø 18.5		M10	M12	M10	M12X1.5	M12X1.5	M12X1.5	M12X1.5	
H	Ø 18.5									

ORDER CODE

POS 1	POS 2	POS 3	POS 4
101	-	5	- T - * *



101(S)-5(T)(TE)(L)(E)

ORDER CODE

POS 1	POS 2	POS 3	POS 4	POS 5	POS 6
101S	-	5			
			-	***	-
				-	**
					-
					*

MOUNTING DATA							
A	B	C	D	E	F	G	H

INTEGRATED VALVE PARAMETER							
RELIEF VALVE PRESSURE SETTINGS (MPA)							
6	7	8	10	12	14	15	16
SHOCK PROOF VALVE PRESSURE SETTINGS IS 6MPA HIGHER THAN RELIEF VALVE							

DISPLACEMENT ML/R										
50	63	80	100	125	160	200	250	280	315	400

ELECTRO-HYDRAULIC CONTROL SIGNAL CONNECTION	- (omission)	NO ELECTROHYDRAULIC SIGNAL.
	L	THE PRESSURE SIGNAL AT LS CONNECTION IS GUIDED OUT OF THE LL CONNECTION
	E	THE PRESSURE SIGNAL AT THE PORT A OR B IS GUIDED OUT OF THE EL CONNECTION

PRIORITY VALVE CONNECTION	- (omission)	MODULARY MOUNTING
	T	PIPE MOUNTING

FUNCTION CODE	5	LOAD SENSING TYPE
---------------	---	-------------------

FOR EXAMPLE:

POS 1	POS 2	POS 3	POS 4	POS 5	POS 6
101S	-	5	T	E	
			-	125	-
				-	10
					-
					E

PORTS: P, T,A,B G1/2; COLUMN MOUNTING THREAD C M10
PORT: LS G1/4; PORT: EL M10X1

RELIEF VALVE PRESSURE SETTINGS 10MPA ,
SHOCKPROOF VALVE PRESSURE SETTINGS 16MPA

DISPLACEMENT: 125 ML/R

PIPE MOUNTING, WITH AN ELECTROHYDRAULIC SIGNAL

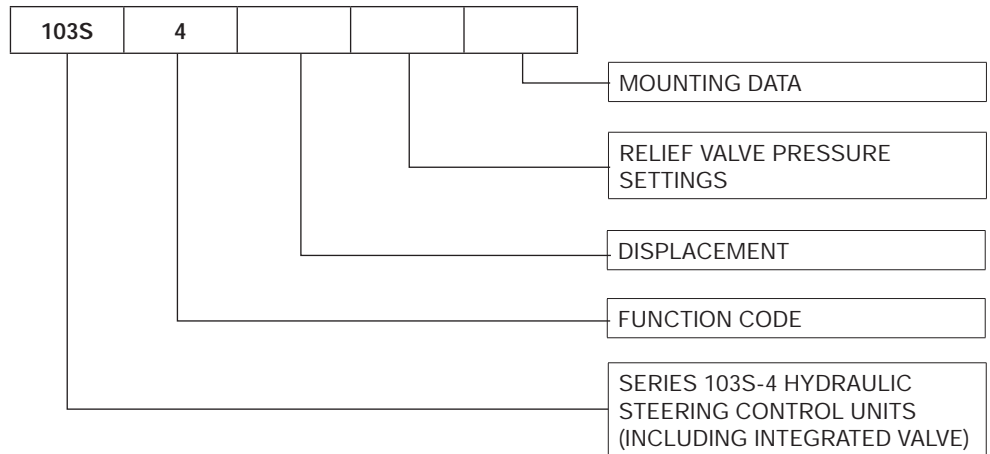
103S-4



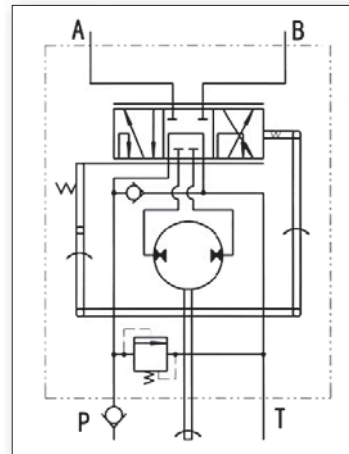
HYDRAULIC STEERING CONTROL UNITS (SCU)

The structure of Series 103S-4 Hydraulic SCU is more compact, its connection dimension meets the international standards, while it is a bit different from that of Series 101 and 102, which is suitable for assembly in the narrow spaces. It's widely used in low-speed vehicles, steering control systems, such as forklifts, tractors, combined harvester, engineering or road construction machinery, marine rudder, etc. It can obtain a more powerful output steering force through the input of less force, it operates easily, flexibly and reliably.

ORDER CODE



FUNCTION CODE



103S-4

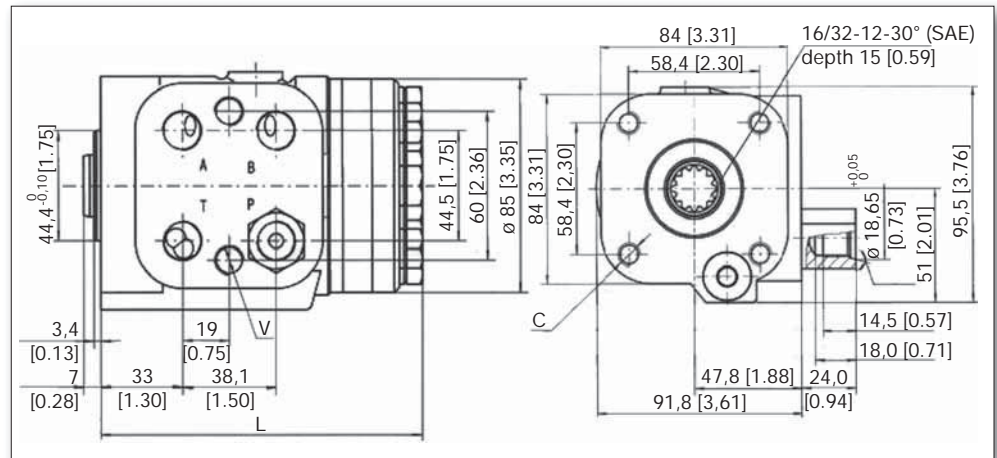
Open Center
Non Load Reaction

103S-4

MAIN SPECIFICATION

PARAMETERS		Model											
		103S -4-***.**.*											
Displacement	(mL/r)	50	63	80	100	125	160	200	250	280	315	400	
	in ³ /r	3.05	3.84	4.88	6.10	7.63	9.76	12.20	15.25	17.08	19.22	24.41	
Rated flow	(L/min)	5	6	8	10	12.5	16.0	20.0	25.0	28.0	32.0	40.0	
	gal/min	1.32	1.66	2.11	2.64	3.30	4.22	5.28	6.60	7.40	8.45	10.5	
Max. input pressure	(MPa)	16											
	PSI	2320											
Relief Valve Pressure Settings	(MPa)	06	07	08	10	12	14	15	16				
	PSI	870	1015	1160	1450	1740	2030	2175	2320				
Max. cont. back pressure	(MPa)	2,5											
	PSI	362											
Weight	kg	4,75	4,81	4,81	4,96	5,10	5,30	5,50	5,73	5,91	6,10	6,50	
	lbs	10.5	10.6	10.8	10.9	11.2	11.7	12.1	12.6	13.0	13.4	14.3	
Dimension L	mm	123	125	127	130	133	138	143	149	154	159	169	
	inches	4.84	4.92	5.00	5.12	5.24	5.43	5.63	5.87	6.06	6.26	6.65	

MOUNTING DATA



PORTS THREADS

CODE	PORTS P, T, A, B		COLUMN MOUNTING C		VALVE MOUNTING V	
	Thread	Depth	Thread	Depth	Thread	Depth
A	6 3/8 - 19 O-RING	14 mm 0.55 in	M10	16 mm 0.63 in	M12	16 mm 0.63 in
B	9/16-18 UNF O-RING					
C	M18X1.5					
D	M18X1.5 O-RING					
F	3/4-16UNF O-RING					
			3/8-16 UNC		3/8-24 UNF	

103S-1,2,4

ORDER CODE

	POS 1			POS 2			POS 3		POS 4
103S	-	4	-	***	-	**	-	**	

MOUNTING DATA				
A	B	C	D	F

INTEGRATED VALVE PARAMETER							
RELIEF VALVE PRESSURE SETTINGS (MPA)							
6	7	8	10	12	14	15	16
SHOCK PROOF VALVE PRESSURE SETTINGS IS 6MPA HIGHER THAN RELIEF VALVE							

DISPLACEMENT ML/R										
50	63	80	100	125	160	200	250	280	315	400

FUNCTION CODE	4	OPEN CENTER NON LOAD REACTION
---------------	---	-------------------------------

FOR EXAMPLE:

102S	-	4	-	125	-	10	-	A
------	---	---	---	-----	---	----	---	---

PORTS: P, T, A, B G3/8; COLUMN MOUNTING THREAD C M10X1.25; VALVE MOUNTING THREAD V M10X1.5;
RELIEF VALVE PRESSURE SETTINGS 10MPA,
DISPLACEMENT: 125 ML/R
OPEN CENTER NON LOAD REACTION

BNF

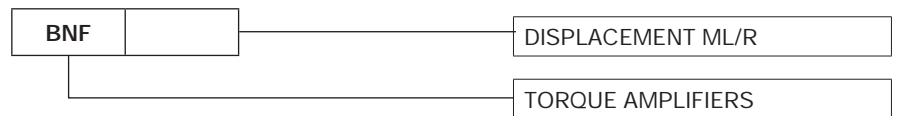
MODEL BNF TORQUE AMPLIFIERS

Model BNF torque amplifier is one of the hydraulic element, which can get high output torque with low input torque. It contains a distributor valve, Gerotor gear set, and a pressure relief valve with the features of comfortable operation, compact volume and easy installation. It can be used in the fields of wheeled vehicle, large manual gate as well as other machineries required high torque.

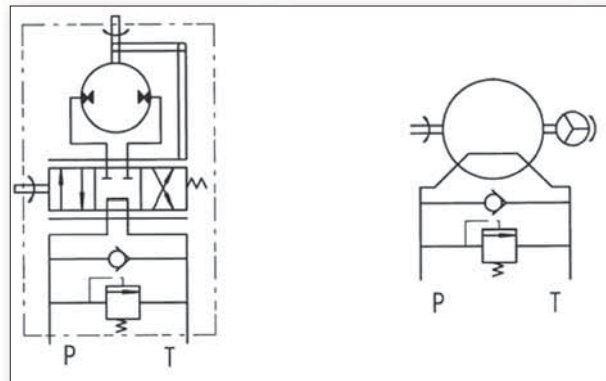
Distributor valve is open center and the power stream fluid circulates through the unit back to the tank at very low pressure when the system is not being steered. When the steering wheel is turned, fluid is led from the steering system pump via the distributor valve to the hydraulic energy (pressure, oil flow) into mechanical energy (torque, speed).

The speed is controlled by the rate of rotation of the steering wheel. The torque on the output shaft is the sum of the manual input torque and the torque from the Gerotor gear set. When the steering wheel is stopped rotating, the distributor valve cuts off the fluid to the Gerotor gear set, and torque amplification is stopped.

ORDER CODE



FUNCTION CODE

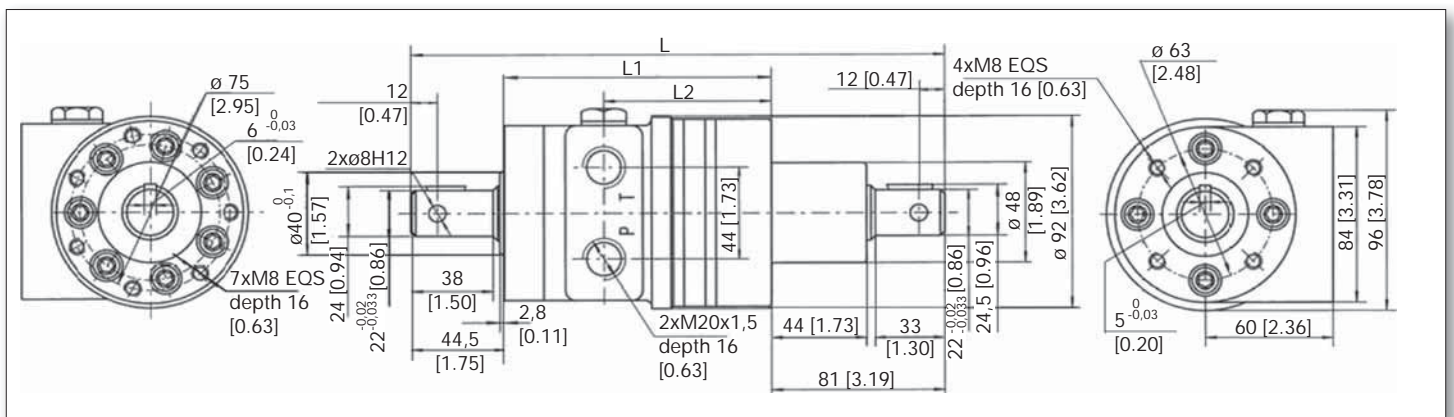


BNF

MAIN SPECIFICATION

MODEL	Displacement		Input torque		Output torque		Relief valve pressure settings		Rated flow		Max. speed	Max. output torque		Max. back pressure	
	(mL /r)	in ³ /r	(N•m)	lb/in	(N•m)	in/lb	(MPa)	psi	(L/min)		(rpm)	(N•m)	lb/in	(MPa)	psi
BNF - 80	80	4.88	3 - 5	26.5 - 44.2	70	619	6.3 - 12.5	913 - 1812	10	2.64	125	150	1327	0,5	73
BNF - 100	100	6.10			85	752			10	2.64	100				
BNF - 125	125	7.63			100	884			12	3.17	100				
BNF - 160	160	9.76			120	1061			16	4.23	100				

MOUNTING DATA



MODEL	BNF-80		BNF-100		BNF-125		BNF-160		
	mm	inches	mm	inches	mm	inches	mm	inches	
DIMENSIONS	L1	125	4.92	127.5	5.02	130.5	5.14	135.5	5.33
	L2	78.5	3.09	81	3.19	84	3.31	89	3.50
	L	249.5	9.82	252	9.92	255	10.04	260	10.24

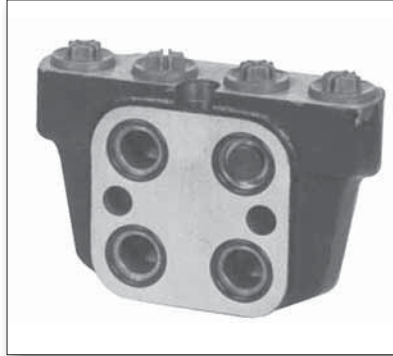
FK

COMBINATORY VALVE BLOCKS

FKA-FKB-FKAR
FKBR-FKC

FKA2-FKB2-FKC2

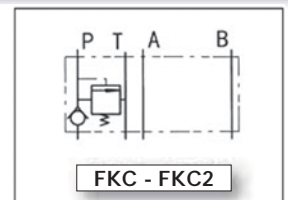
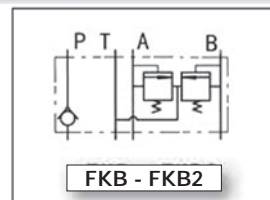
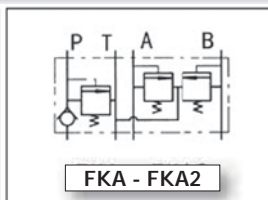
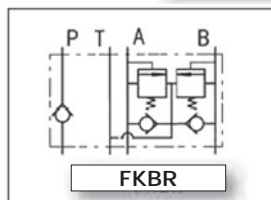
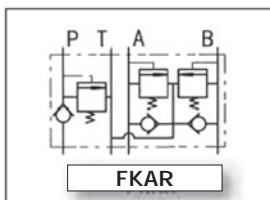
Model FKA, FKB, FKC, FKAR, FKBR crossover relief valves and model FKA2, FKB2, FKC2 cushion crossover anticavitation relief valves. Being a combinatory valve, it can bolt directly to the port face of Model BZZ steering unit to form a complete set. The valve contains dual shockproof valves to protect the steering unit, hoses and steering cylinder from excessive system pressure due to sudden shock forces at the vehicle wheels and prevents such forces from being transmitted to the steering wheel. It also contains suction valves to help prevent cavitation at the low pressure side of the cylinder, an inlet check valve prevents reversed flow load circuit, a relief valve is the protection for the pump.



ORDER CODE

FK			-		*	DUAL SHOCKPROOF VALVE PRESSURE MPA
						FLOW L/MIN
						STEERING SYSTEM OPERATING PRESSURE MPA
						No mark: CROSSOVER RELIEF VALVE
					2	CUSHION CROSSOVER ANTICAVITATION RELIEF VALVE
					AR	CONTAINS INLET CHECK VALVE, RELIEF VALVE, DUAL SHOCKPROOF VALVE AND SUCTION VALVE
					A	CONTAINS INLET CHECK VALVE, RELIEF VALVE AND DUAL SHOCKPROOF VALVE
					BR	CONTAINS INLET CHECK VALVE, DUAL SHOCKPROOF VALVE AND SUCTION VALVE,
					B	CONTAINS INLET CHECK VALVE AND DUAL SHOCKPROOF VALVE
					C	CONTAINS INLET CHECK VALVE AND RELIEF VALVE
						COMBINATORY VALVE BLOCK

FUNCTION CODE

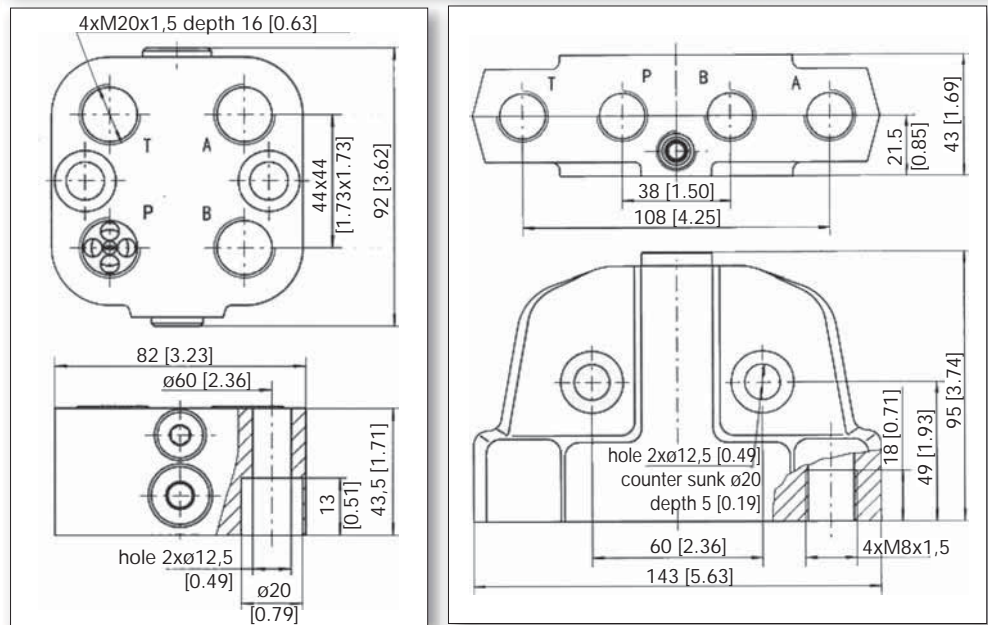


FK

MAIN SPECIFICATION

MODEL	Rated flow		Inlet check valve open pressure		Relief valve pressure range		Dual shockproof valve pressure range		Suction valve open pressure	
	(L/min)	gal/min	(MPa)	psi	(MPa)	psi	(MPa)	psi	(MPa)	psi
FKAR FKA FKA2	30/60	7.93/15.85	0.1	1.45	2.5 - 16	362 - 2320	6.3 - 20	913 - 2900	0.05	7.25
FKBR FKB FKB2	30	7.93			2.5 - 16	362 - 2320	6.3 - 20	913 - 2900	0.05	7.25
FKC FKC2	30/60	7.93/15.85			2.5 - 16	362 - 2320	6.3 - 20	913 - 2900	0.05	7.25

MOUNTING DATA

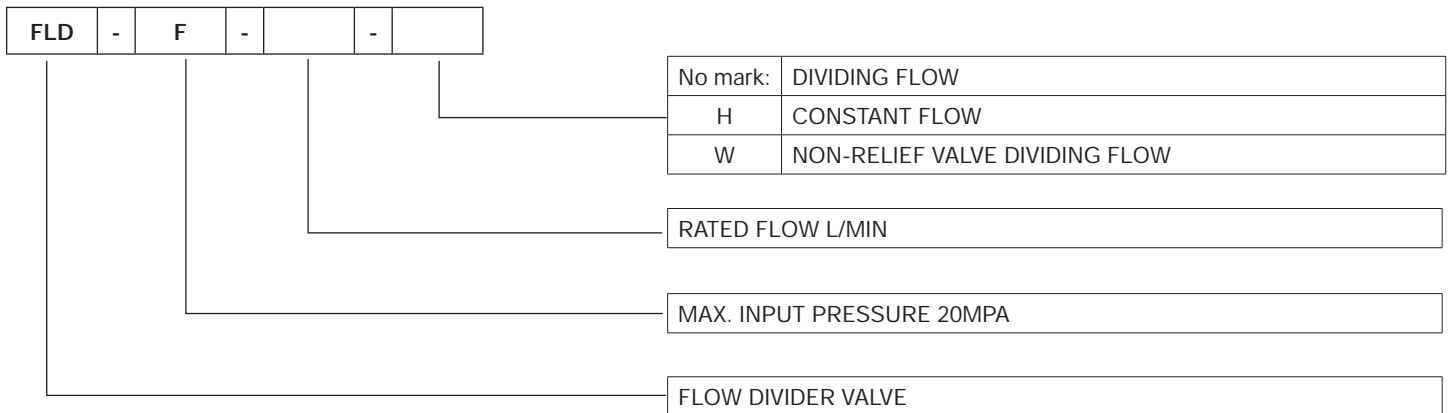


FLD

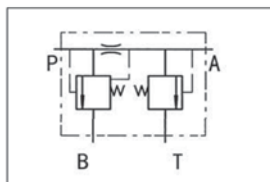
MODEL FLD FLOW DIVIDER VALVES

It is used to supply a complete set of model BZZ steering control units. Under such conditions of variety oil volume or /and different pressure in steering system, model FLD can provide constant flow for the steering unit so as to meet the requirement of hydraulic steering performance of vehicle. It can not only control steering system, but also helps pump to divide flow resulting in reduce cost and simplify system design.

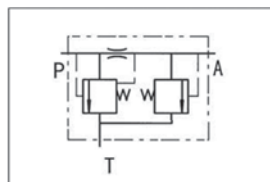
ORDER CODE



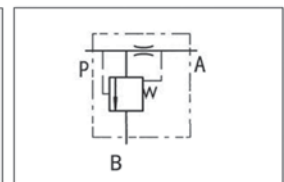
FUNCTION CODE



dividing flow



constant flow



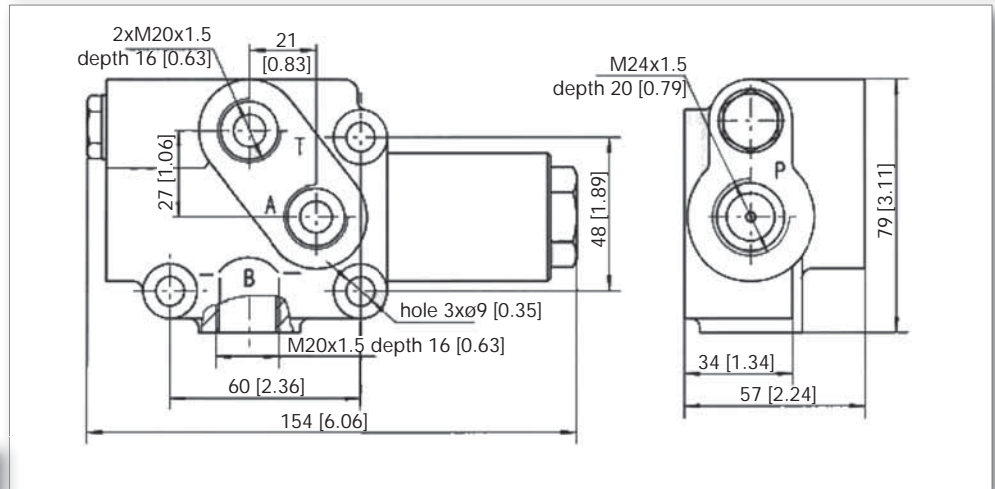
non-relief valve
dividing flow

FLD

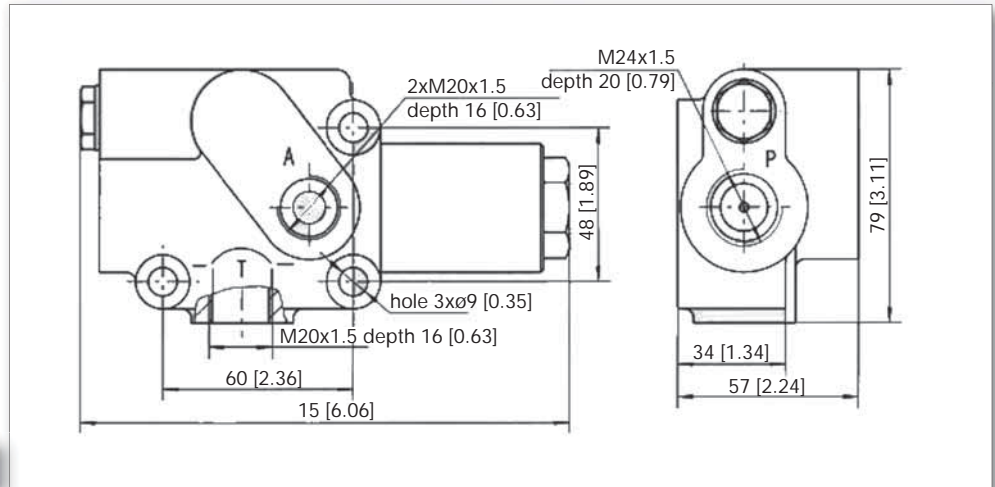
MAIN SPECIFICATION

MODEL	Rated flow		Max input flow		Max input pressure		Relief valve pressure range		Variation of flow	Fit with steering unit
	L/min	gal/min	L/min	gal/min	Mpa	psi	Mpa	psi	%	
FLD-F4 *	4	1.06	45	11.89	20	2900	6.3 - 16	9.1 - 23.2	15	BZZ1-E50
FLD-F5 *	5	1.32								BZZ1-E63
FLD-F6 *	6	1.59								BZZ1-E80
FLD-F7.5 *	7.5	1.98								BZZ1-E100
FLD-F9.5 *	9.5	2.51								BZZ1-E125
FLD-F12 *	12	3.17								BZZ1-E160
FLD-F15 *	15	3.96								BZZ1-E200
FLD-F19 *	19	5.02	60	15.85	20	2900	6.3 - 16	9.1 - 23.2	20	BZZ1-E250
FLD-F24 *	24	6.34	75	28.80					BZZ1-E315	
FLD-F30 *	30	7.94	90	23.78					BZZ1-E400	
FLD-F38 *	38	10.04	120	31.70					BZZ1-E500	
FLD-F48 *	48	12.68							BZZ1-E630	
FLD-F60 *	60	15.85							BZZ1-E800	
FLD-F75 *	75	19.81	200	52.84					BZZ1-E1000	

MOUNTING DATA



FLD-F4-15

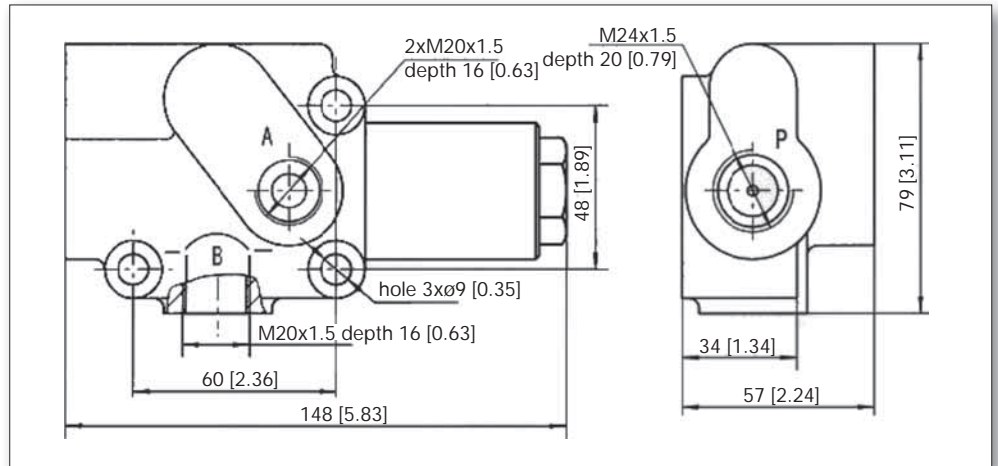


FLD-F4-15H

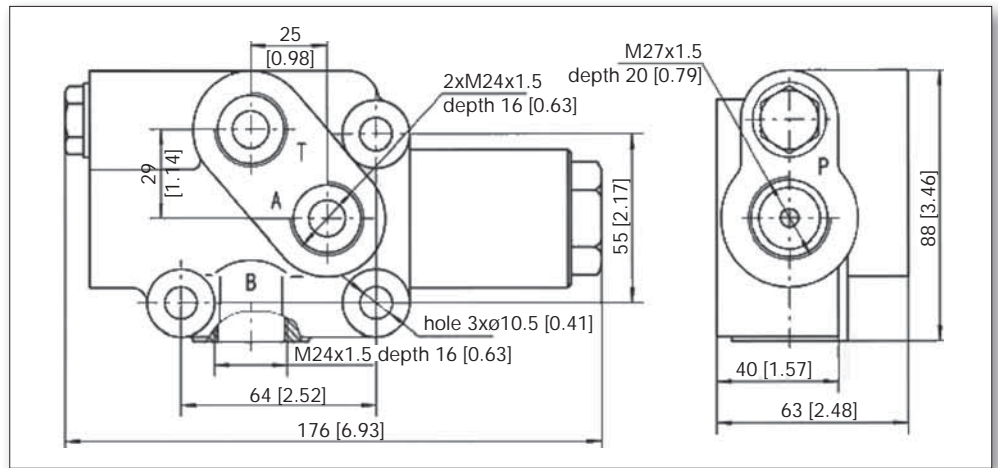
FLD

MOUNTING DATA

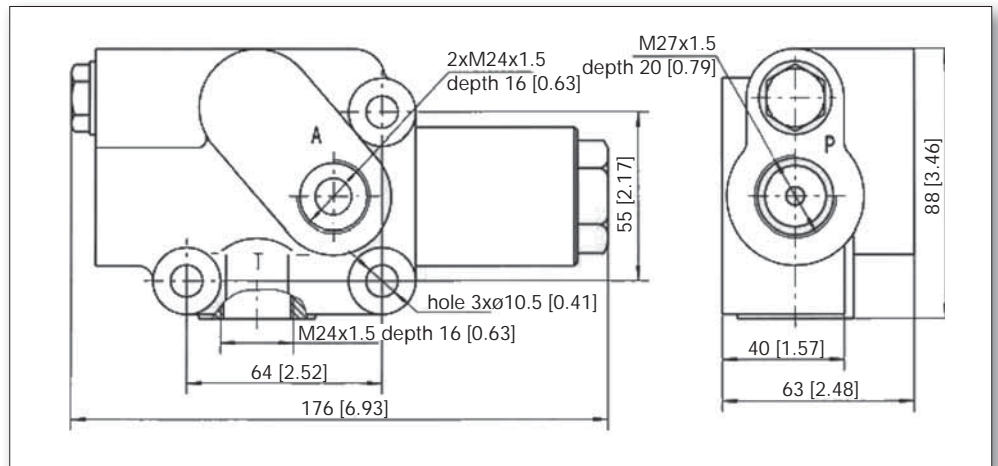
FLD-F4-15W



FLD-F19-30



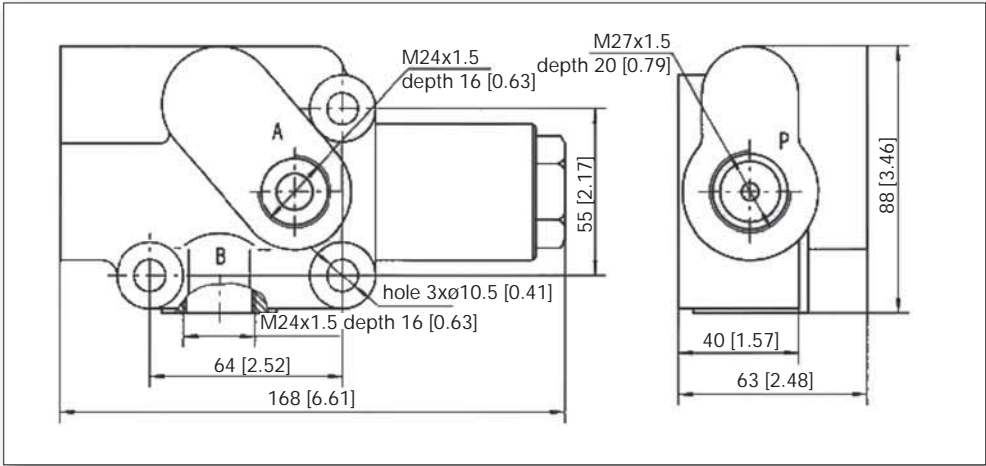
FLD-F19-30H



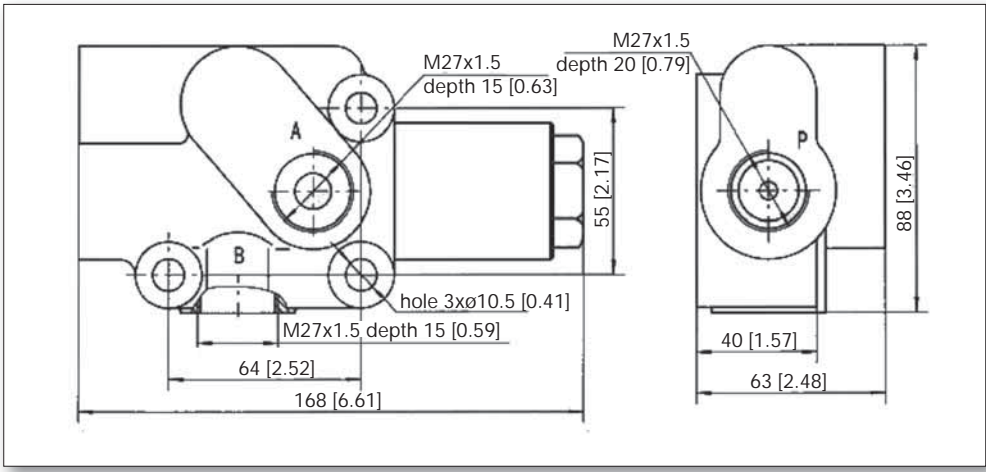
FLD

MOUNTING DATA

FLD-F19-30W



FLD-F38-75W



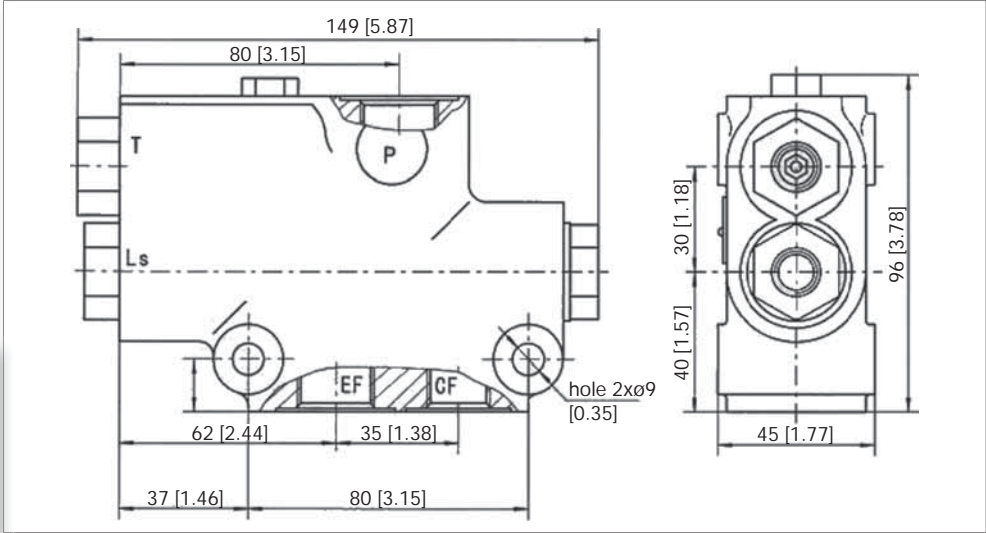
DYXL - YXL

MAIN SPECIFICATION

MODEL	Control pressure (MPa)		Max. input flow		Max. input pressure (MPa)		Setting pressure
	MPa	psi	l/min	gal/min	MPa	psi	
YXL-F40L-4.5-	0.45	65.25	40	10.57	20	2900	6.3 - 16 MPa 914- 2320 psi ADJUSTED BY CUSTOMER'S REQUIREMENT
YXL-F40L-7-	0.7	101.50					
YXL-F40L-10.5-	1.05	152.25					
YXL-F80L-4.5-	0.45	65.25	80	21.13			
YXL-F80L-7-	0.7	101.50					
YXL-F80L-10.5-	1.05	152.25					
YXL-F160L-4.5-	0.45	65.25	160	42.27			
YXL-F160L-7-	0.7	101.50					
YXL-F160L-10.5-	1.05	152.25					
YXL-F250-4.5-	0.45	65.25	250	66.04			
YXL-F250-7-	0.7	101.50					
YXL-F250-10.5-	1.05	152.25					

MOUNTING DATA

YXL-F40L
DYXL-F40L
YXL-F80L
DYXL-F80L

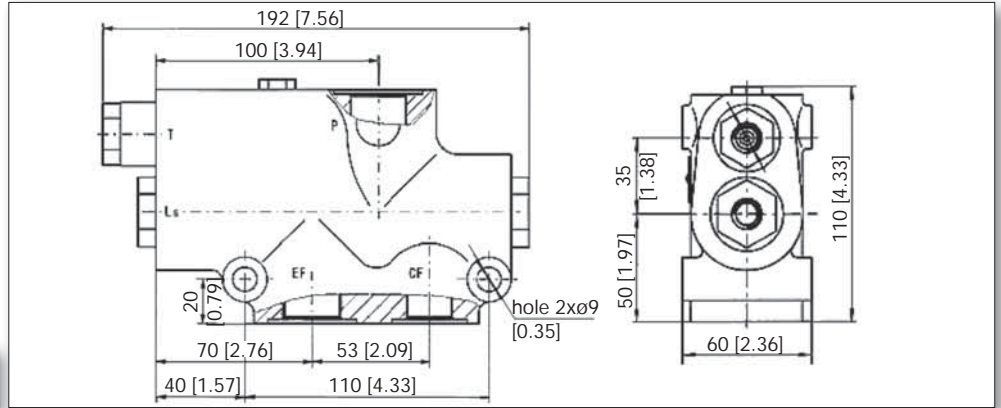


CODE	PORTS P - E F		PORT CF		PORTS LS - T	
	Thread	Depth	Thread	Depth	Thread	Depth
A	M22X1.5	16 mm 0.63 in	M18X1.5	16 mm 0.63 in	M12X1.5	16 mm 0.63 in
B	G1/2		G3/8			
C	7/8-14UNF O-RING		3/4-16UNF O-RING			
D	M22X1.5 O-RING		M18X1.5 O-RING			

DYXL - YXL

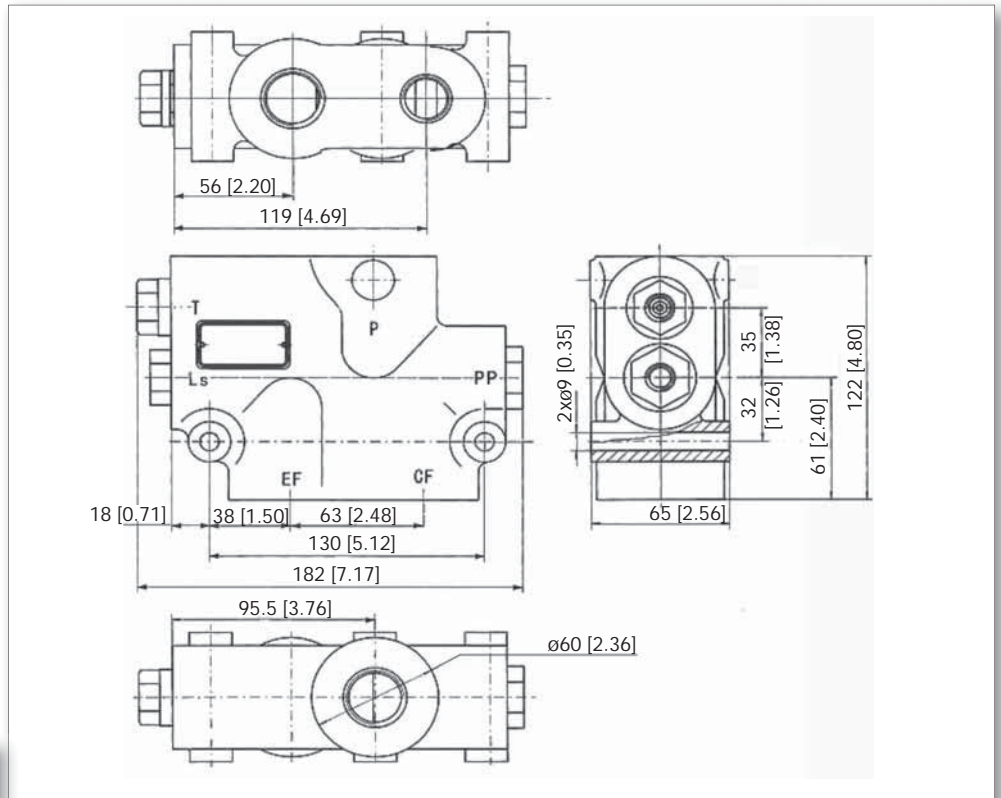
MOUNTING DATA

YXL-F160L



CODE	PORTS P - E F		PORT CF		PORTS LS - T	
	Thread	Depth	Thread	Depth	Thread	Depth
A	M27X2	22 mm 0.87 in	M22X1.5	18 mm 0.71 in	M12X1.5	14 mm 0.55 in
B	G3/4		G1/2		G1/4	
C	1-1/16-12UN O-RING		3/4-16UNF O-RING		7/16-20UNF O-RING	
D	M27X2 O-RING		M22X1.5 O-RING		M12X1.5 O-RING	

DYXL-F160L

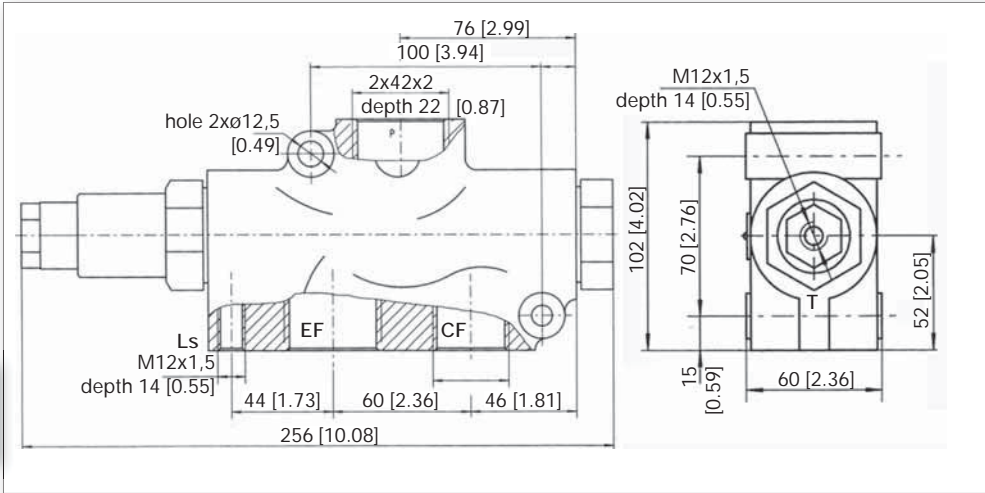


CODE	PORTS P - E F		PORT CF		PORTS LS - T	
	Thread	Depth	Thread	Depth	Thread	Depth
A	M27X2	22 mm 0.87 in	M22X1.5	18 mm 0.71 in	M12X1.5	14 mm 0.55 in
B	G3/4		G1/2		G1/4	
C	1-1/16-12UN O-RING		3/4-16UNF O-RING		7/16-20UNF O-RING	
D	M27X2 O-RING		M22X1.5 O-RING		M12X1.5 O-RING	

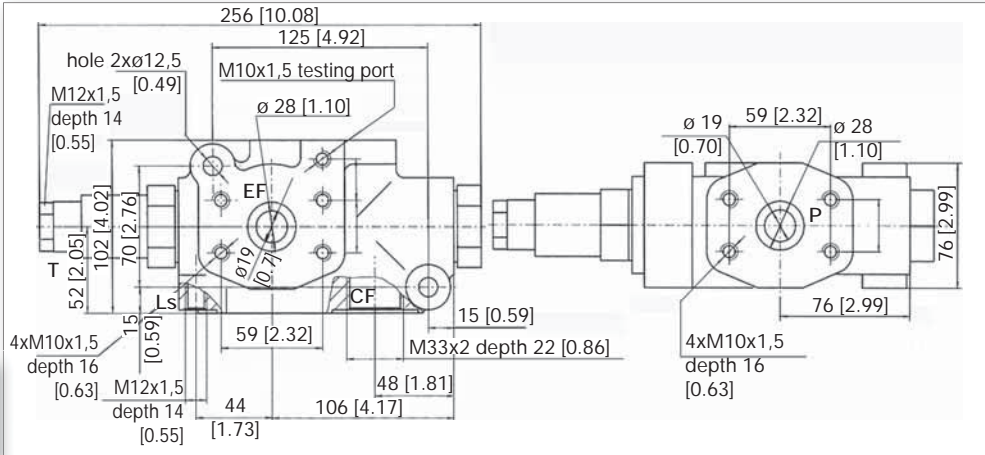
DYXL - YXL

MOUNTING DATA

YXL-F250L
DYXL-F250L



YXL-F250F
DYXL-F250F



DYXL YXL

ORDER CODE

POS 1 POS 2 POS 3 POS 4 POS 5 POS 6 POS 7

*	YXL	-	F	*	*	*	*	*	*
---	-----	---	---	---	---	---	---	---	---

SIGNAL MODEL	-	STATIC SIGNAL
	D	DYNAMIC SIGNAL

MAX.INPUT FLOW (L/MIN)			
40	80	160	250

MOUNTING TYPE	L	THREAD CONNECTION
	F	FLANGE CONNECTION

RELIEF VALVE PRESSURE SETTINGS					
8	10	12	14	15	16

CONTROL TYPE	N	INTERNAL CONTROL
	W	OUTER CONTROL

CONTROL PRESSURE (BAR)		
4.5	7	10.5

MOUNTING DATA			
A	B	C	D

FOR EXAMPLE

D	YXL	-	F	160	L	12	N	7	B
---	-----	---	---	-----	---	----	---	---	---

PORTS:PEF G3/4;PORT:CF G1/2;PORTS:LS,T G1/4

CONTROL PRESSURE:
7 (BAR) • 101.5 (PSI)

INTERNAL CONTROL:N

RELIEF VALVE PRESSURE SETTINGS:
12 (MPA) • 17.4 (PSI)

THREAD CONNECTION:L

RATED FLOW:
160 (L/MIN) • 42.3 (GAL/MIN)

PRIORITY VALVE

DYNAMIC SIGNAL

P V 40,60,80 PRIORITY VALVES

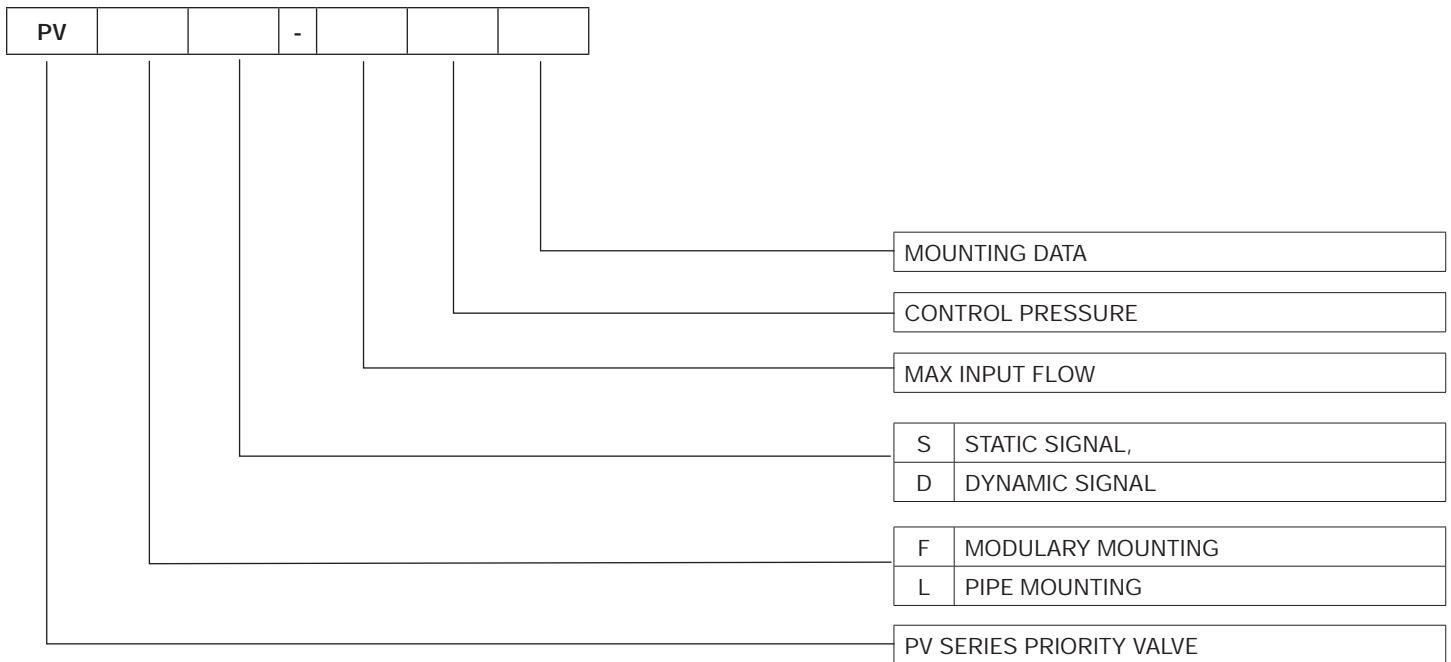


The priority valve automatically adjusts for varying input flow conditions in order to maintain the desired primary output flow rate. Excess flow is directed to a reservoir or secondary device. PV** -40,60,80 series priority valves is modular design matched with the 101S-5(L)(E) or 102(S)-5(L)(E) SCU; PVF* - 40,60,80 priority valve has 2 types of signals: PVFS-40,60,80 static signal, PVFD-40,60,80 dynamic signals.

PVL* -40,60,80 series priority valve is pipe design, matched with the 101(S)-5T(TE) or 102(S)-5T(TE) SCU, PVL* -40,60,80 priority valve has 2 types of signals: PVLS40,60,80 static signal, PVLD-40,60,80 dynamic signals.

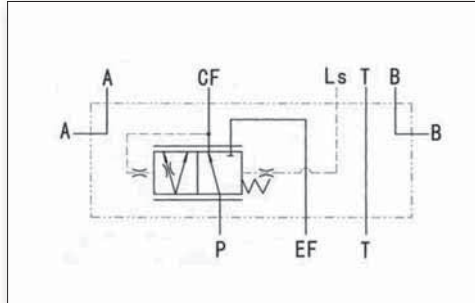
PV** -40,60,80 series priority valve is not interchangeable with the Ls inlet pressure control relief valve, the relief valve integrated in the SCU.

ORDER CODE

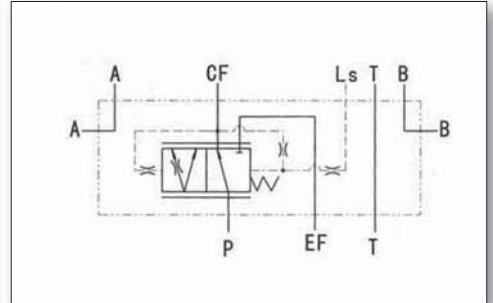


P V -40,60,80

FUNCTION CODE

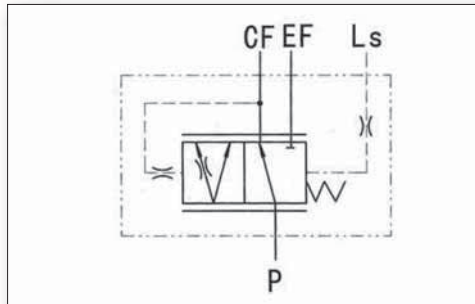


PVFS-40,60,80 Static Signal

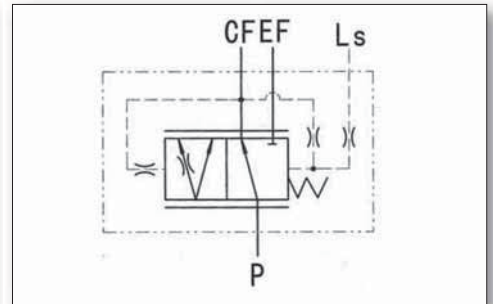


PVFD-40,60,80 Dynamic Signal

MODULARY MOUNTING



PVLS-40,60,80 Static Signal



PVLD-40,60,80 Dynamic Signal

PIPE MOUNTING

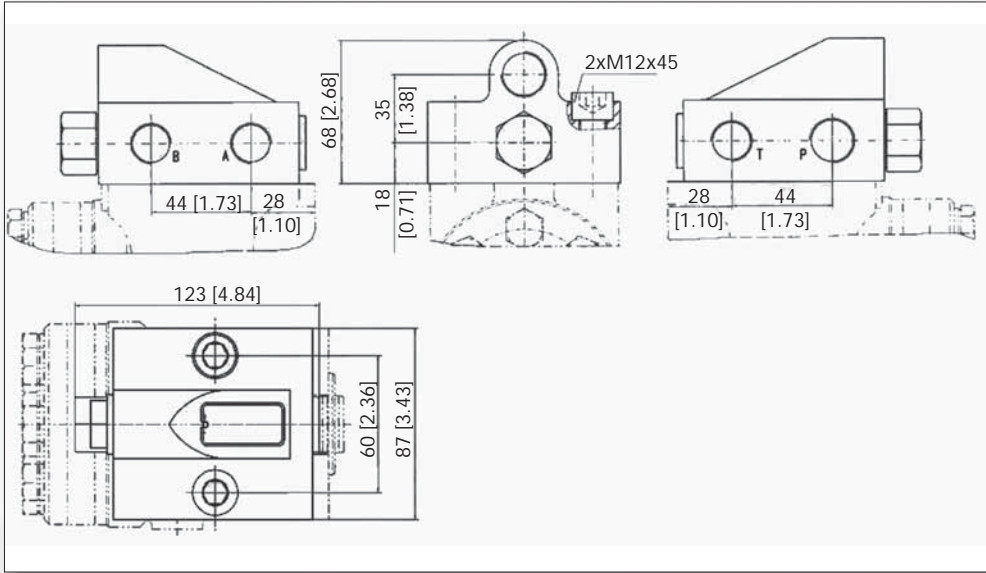
MAIN SPECIFICATION

PARAMETERS		MODEL		
		PVFS(D)		PVLS(D)
MAX. INPUT FLOW	(L/min)	40, 60, 80		
	gal/min	10.57, 15.85, 21.13		
CONTROL PRESSURE	(MPa)	0.45	0.7	1.05
	psi	65.25	101.50	152.25
MAX. PRESSURE IN OIL: P, EF	(MPa)	20		
	psi	2900		
MAX. PRESSURE IN OIL: LS, CF	(MPa)	16		
	psi	2320		

P V -40,60,80

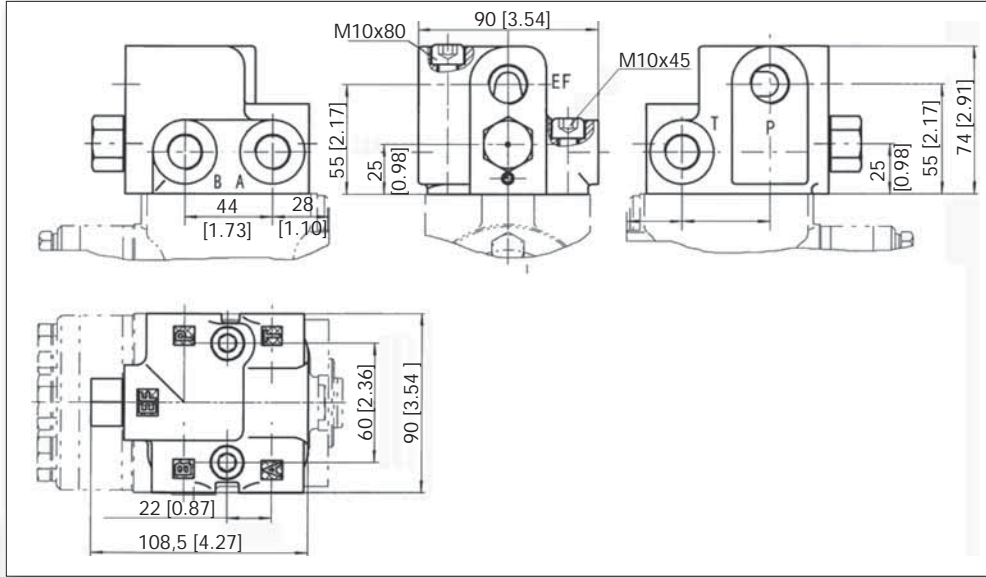
MOUNTING DATA

PVFS(D)-40



CODE	PORTS P - E F		PORTS T A B	
	Thread	Depth	Thread	Depth
A	M20X1.5	14 mm 0.55 in	M18X1.5	14 mm 0.55 in
B	G1/2		G3/8	
C	7/8-14UNF O-RING		3/4-16UNF O-RING	
D	M20X1.5 O-RING		M18X1.5 O-RING	

PVFS(D)-60

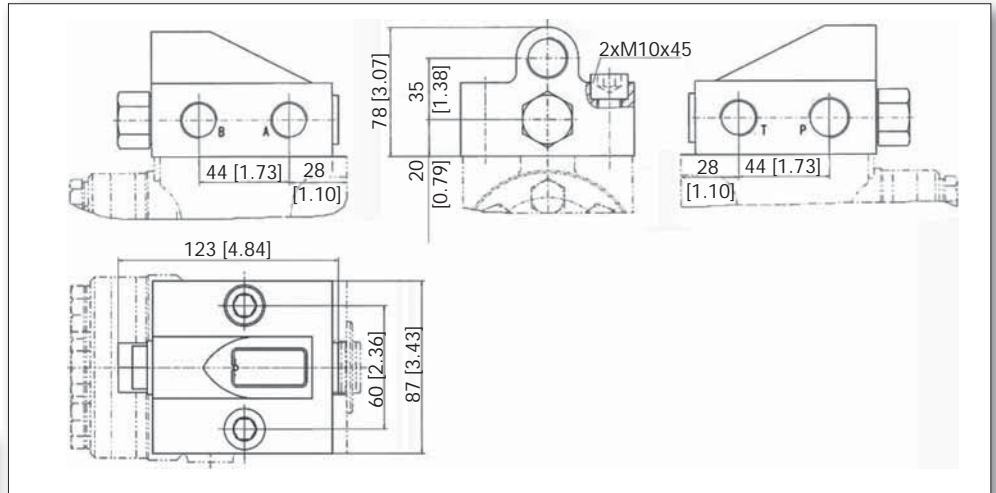


CODE	PORTS P - E F		PORTS T A B	
	Thread	Depth	Thread	Depth
A	M20X1.5	14 mm 0.55 in	M18X1.5	14 mm 0.55 in
B	G1/2		G3/8	
C	7/8-14UNF O-RING		3/4-16UNF O-RING	
D	M20X1.5 O-RING		M18X1.5 O-RING	

P V -40,60,80

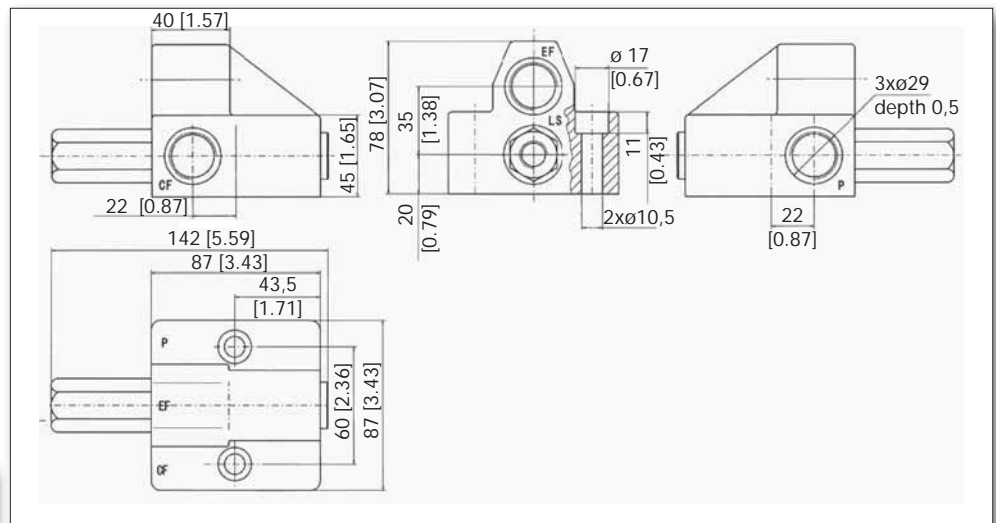
MOUNTING DATA

PVFS(D)-80



CODE	PORTS P - E F		PORTS T A B	
	Thread	Depth	Thread	Depth
A	M22X1.5	14 mm 0.55 in	M18X1.5	14 mm 0.55 in
B	G1/2		G3/8	
C	7/8-14UNF O-RING		3/4-16UNF O-RING	
D	M22X1.5 O-RING		M18X1.5 O-RING	

PVLS(D)-80



CODE	PORTS P - E F		PORT CF		PORTS LS - T	
	Thread	Depth	Thread	Depth	Thread	Depth
A	M22X1.5	14 mm 0.55 in	M18X1.5	14 mm 0.55 in	M12X1.5	14 mm 0.55 in
B	G1/2		G3/8			
C	7/8-14UNF O-RING		3/4-16UNF O-RING			
D	M22X1.5 O-RING		M18X1.5 O-RING			

P V -40,60,80

ORDER CODE

	POS 1	POS 2	POS 3	POS 4	POS 5
PV	*	*	- **	- **	- ***

MOUNTING DATA					
A	B	C	D		
CONTROL PRESSURE					
MPa	psi	MPa	psi	MPa	psi
0.45	65.25	0.7	101.50	1.05	152.25
MAX.INPUT FLOW					
l/min	gal/min	l/min	gal/min	l/min	gal/min
40	10.57	60	15.85	80	21.13
SIGNAL MODEL	S	STATIC SIGNAL			
	D	DYNAMIC SIGNAL			
MOUNTING	F	MODULARY MOUNTING			
	L	PIPE MOUNTING			

FOR EXAMPLE:

PV	F	D	-	40	-	0.7	-	B
----	---	---	---	----	---	-----	---	---

PORTS P,EF G1/2; PORTS T, A, B G3/8.
CONTROL PRESSURE: 0.7 MPa • 1.015 psi
MAX.INPUT FLOW: 40 L/min. • 10.57 gal/min
DYNAMIC SIGNAL.

F Z

MODEL FZ STEERING COLUMNS

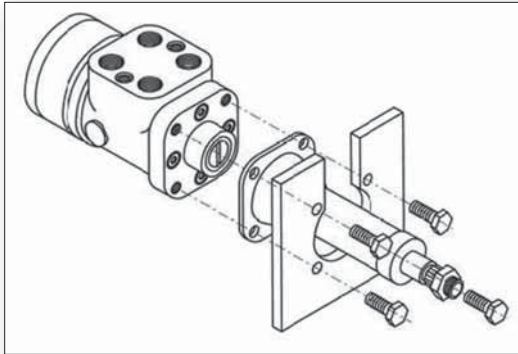


Model FZ steering column suits all type of steering units. We offer a wide range of specifications to fit many applications.

MAIN SPECIFICATION

MODEL	length series (mm)	Max.permissible load N•m	
		dynamic	static
FZ1-FZ2-FZ2A	140 200 225 250 275 300 325 350 375 400 425 450 475 500 550 600 650 700 750 800 850 900 950 1000 1100 1200	80	300

RECOMMENDABLE MOUNTING EXAMPLE



No other hardware to be mounted between steering unit and steering column.

ORDER CODE

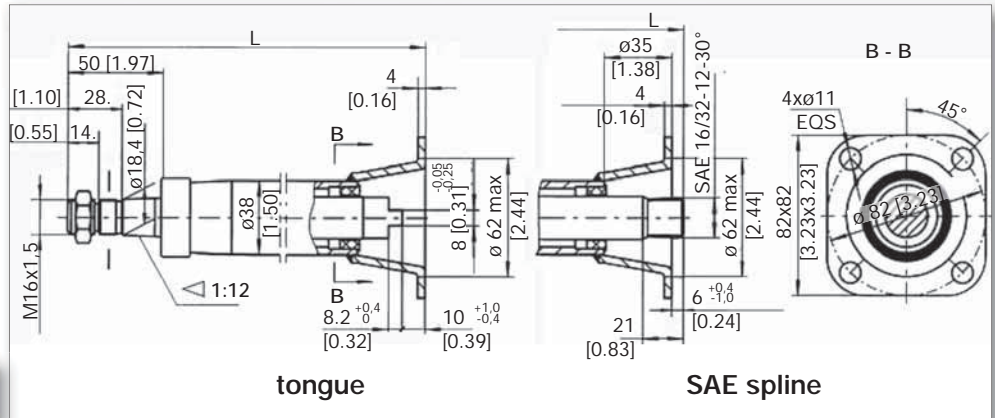


FLANGE LINKAGE TYPE	
F	SQUARE
OUTPUT END LINKAGE TYPE	
HA	SAE SPLINE
EA	TONGUE
STEERING-WHEEL LINKAGE TYPE	
H	SERRATION(SHAFT TAPER 1:12)
D	WOODRUFFKEY KEY(SHAFT TAPER1:12)
LENGTH OF STEERING COLUMN	
FUNCTION	
1	WITHOUT HORN WIRE
2	WITH HORN WIRE FROM TOP
2A	WITH HORN WIRE FROM SIDE
STEERING COLUMN	

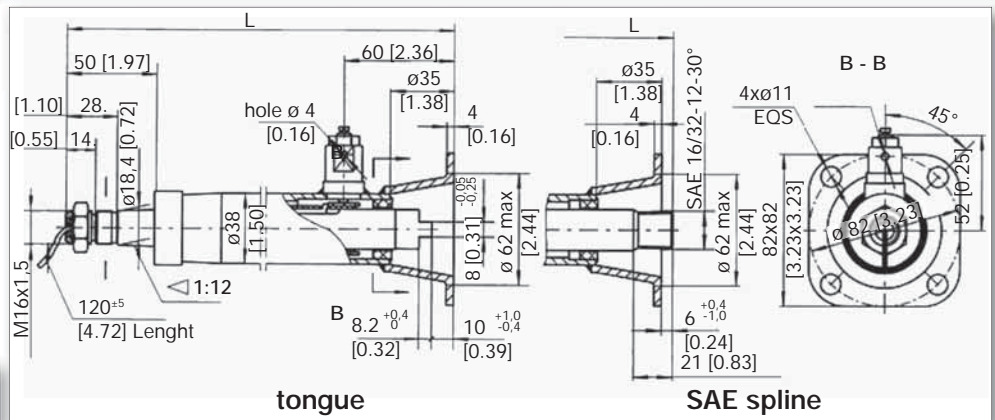
FZ

MOUNTING DATA

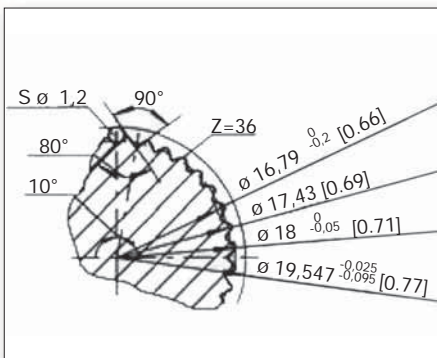
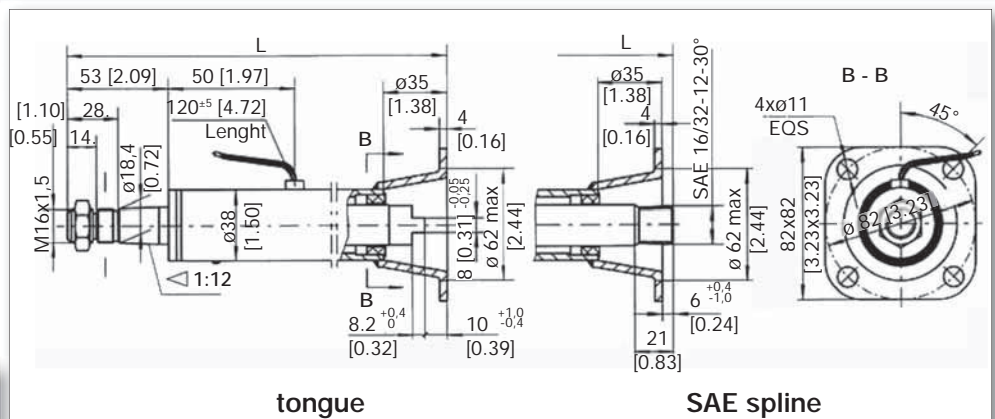
FZ1 series



FZ2 series



FZ2a series



Note:

- 1 All above are available 90 days from our factory.
- 2 Please contact us if any additional requirements not shown in this catalog .
- 3 Due to improvement of product, please forgive us if we change at any time without notice.



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