

## Hydrostatic Steering Flow Amplifier type HSFA

### INTRODUCTION



The Hydrostatic Steering Flow Amplifier type HSFA is a complex set designed for the steering control of self-propelled machines, at a speed not exceeding 50 km/h. It consists of a collaborative Hydrostatic Steering and a Flow amplifier.

The Hydrostatic Steering Unit "Closed Center - Non reaction, with Load Sensing LS port" type HKUS ... /5 is provided with check valve, crossover relief valve, anti-shock valve and anti-cavitation valve as standard.

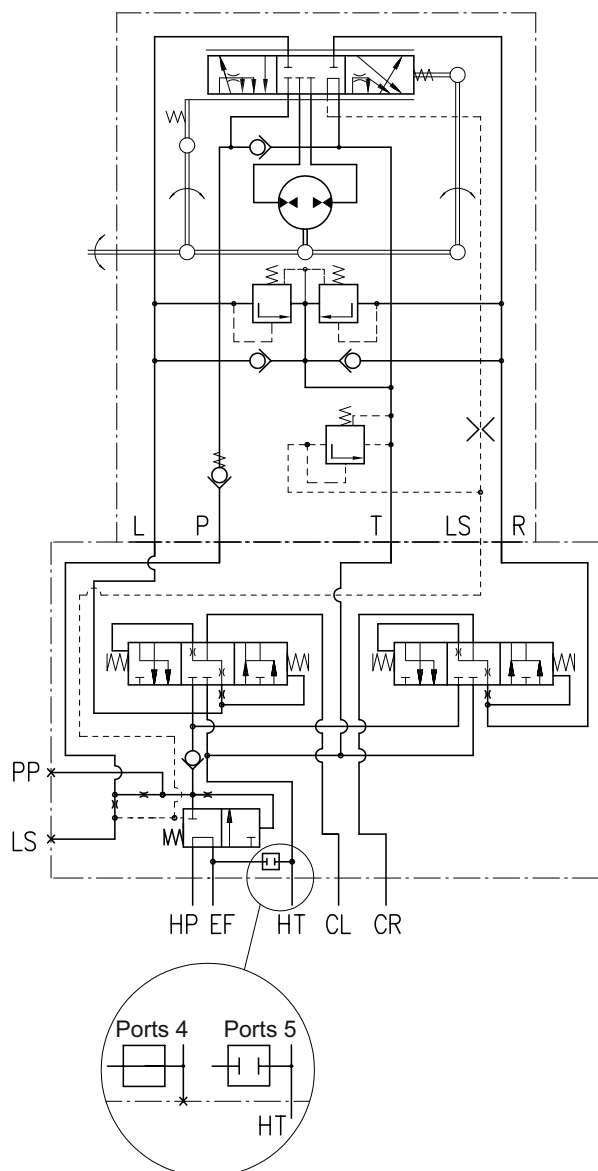
The Flow Amplifier is amplifying device type SAD8, which performs a proportional increase in the flow of working fluid from the steering to the active area of the executive/steering hydraulic cylinder.

It performs proportional division of the working fluid from the passive area of the cylinder in the drain line of the Steering Unit and at the same time in the drain line of the Flow amplifier. The Flow amplifier is also equipped with a priority valve that provides a collaborative operation of the Steering Unit and the working hydraulic equipment of the machine, powered by a feeding pump giving priority the Steering Unit.

The Flow Amplifiers SAD run with a gain of  $K=8$ .

The Hydrostatic Steering Amplifier type HSFA has two versions in regards to the line ports options. The first model is designed with 5 /five/ ports, as the T line of the Steering unit and the EF line of the amplifier for the working hydraulic equipment are separated. The second model has four line ports, as the T line and EF line are united. This option enables to reduce the external hydraulic lines and is used in machines that do not require additional power supply to the working hydraulic equipment.

The main advantages of HSFA are: reliable steering of the machine, good ergonomics, smoother and softer rotation of the wheel, providing an easy emergency control of the machine, energy saving effect and compactness of the Steering system.



## SPECIFICATION DATA

Parameters		Type					
		HSFA 80/640	HSFA 100/800	HSFA 125/1000	HSFA 160/1280	HSFA 200/1600	HSFA 250/2000
Displacement of the Steering Unit	cm <sup>3</sup> /rev [in <sup>3</sup> /rev]	80 [4.88]	100 [6.10]	125 [7.63]	160 [9.76]	200 [12.20]	250 [15.26]
Displacement of the Flow Amplifier	cm <sup>3</sup> /rev [in <sup>3</sup> /rev]	640 [39.06]	800 [48.82]	1000 [61.02]	1280 [78.11]	1600 [97.64]	2000 [122.05]
Amplifying factor*	-	8					
Nominal Flow	lpm [GPM]	160 [42.3]					
Max. Pressure	bar [PSI]	210 [3045]					
LS-Valve Pressure Settings**	bar [PSI]	80 [1160]	100 [1450]	125 [1810]	150 [2175]	175 [2540]	
Shock Valves Pressure Settings***	bar [PSI]	140 [2030]	160 [2320]	180 [2610]	200 [2900]	220 [3190]	
Max. Cont. Pressure in Line <b>HT</b> or <b>EF</b> ****	bar [PSI]	15 [220]					
Max. Torque at Servoamplifying	Nm [lb-in]	4 [35]					
Max. Torque w/o Servoamplifying	Nm [lb-in]	120 [1065]					
Pressure Drop in neutral position	bar [PSI]	7 [102]					
Weight	kg [lb]	10,4 [22.9]	10,5 [23.1]	10,6 [23.4]	10,8 [23.8]	11,1 [24.5]	11,3 [24.9]
Dimension A	mm [in]	136,2 [5.36]	138,8 [5.46]	142,2 [5.59]	146,8 [5.78]	152,2 [5.99]	158,8 [6.25]

\* Amplifying factor K=6, by special customer request.

\*\* Pressure Settings are at flow rate of 25 lpm [6.6 GPM] and viscosity 21 mm<sup>2</sup>/s [105 SUS] at 50° C [122°F], supplied through priority valve.

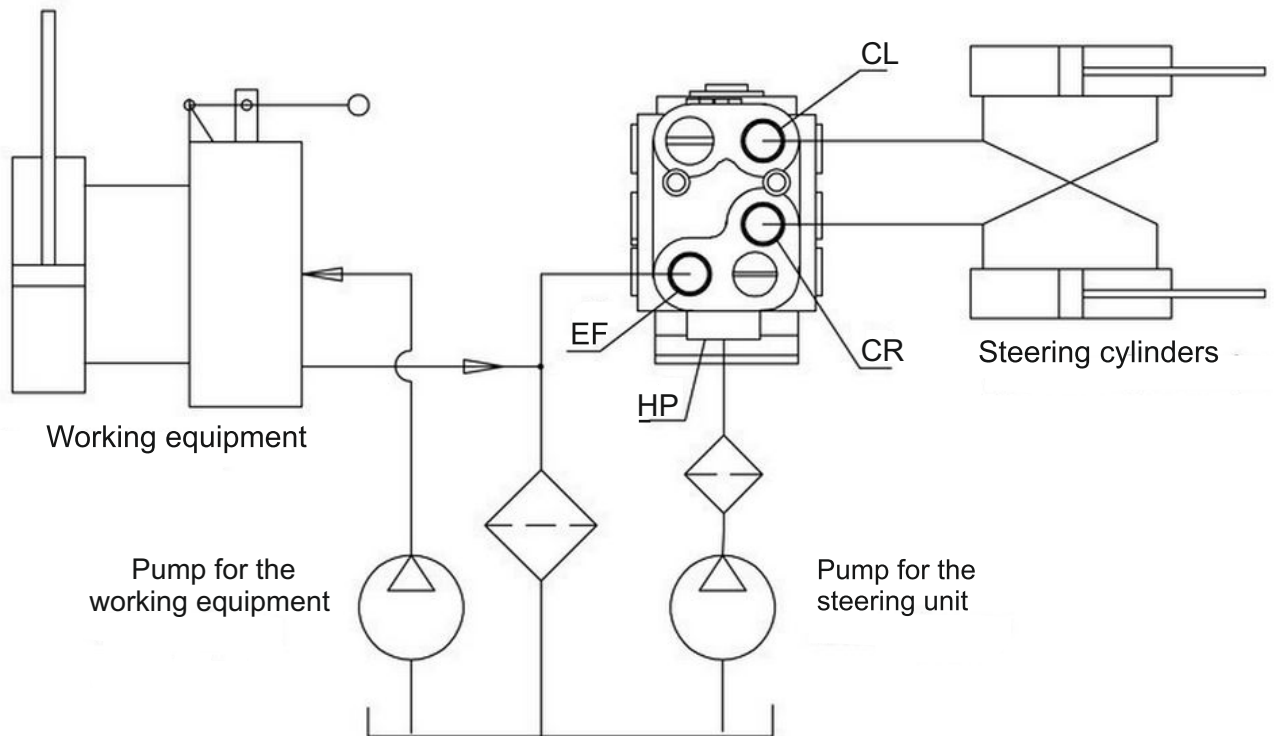
\*\*\* Pressure Settings are at flow rate of 2 lpm [.53 GPM] and viscosity 21 mm<sup>2</sup>/s [105 SUS] at 50° C [122°F].

\*\*\*\* Valid for HSFA.../...-4 only (with 4 feeding ports).

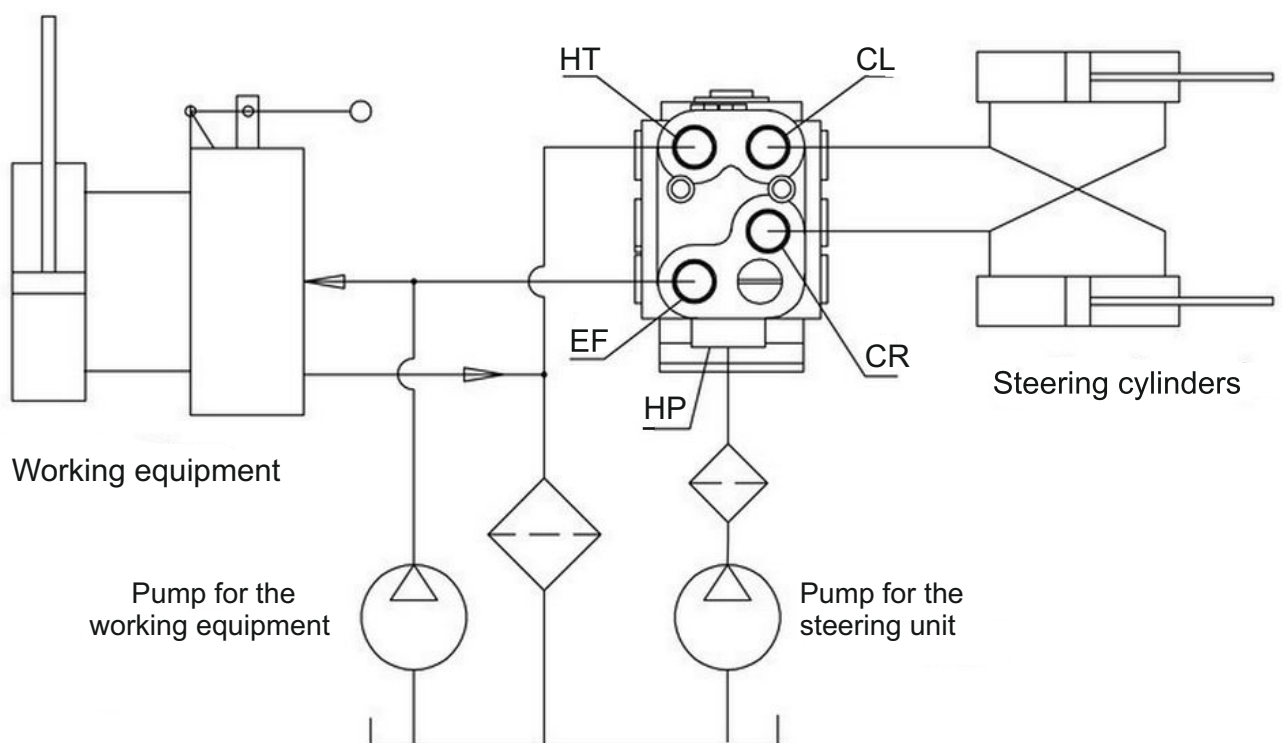
1. Recommended filtration is per ISO cleanliness code 19/16. A nominal filtration of 25 micron or better.
2. Recommend using a premium quality, anti-wear type mineral based hydraulic oil HLP(DIN51524) or HM ( ISO 6743/4). If using synthetic fluids consult the factory for alternative seal materials.
3. Recommended oil viscosity 10 - 300 mm<sup>2</sup>/s [100 - 1500 SUS] at 50°C [122°F].
4. Recommended system operating temperature is -40°...+80°C [-104°F...+176°F].



**MOUNTING SCHEME OF FLOW AMPLIFIER WITH 4 PORTS**



**MOUNTING SCHEME OF FLOW AMPLIFIER WITH 5 PORTS**



## ORDER CODE

	1	2	3	4	5	6	7
<b>HSFA</b>		/	-	-			

**Pos.1 - Displacement code of the Steering Unit**

<b>80</b>	- 80,0 cm <sup>3</sup> /rev [ 4.88 in <sup>3</sup> /rev]
<b>100</b>	- 100,0 cm <sup>3</sup> /rev [ 6.10 in <sup>3</sup> /rev]
<b>125</b>	- 125,0 cm <sup>3</sup> /rev [ 7.63 in <sup>3</sup> /rev]
<b>160</b>	- 160,0 cm <sup>3</sup> /rev [ 9.76 in <sup>3</sup> /rev]
<b>200</b>	- 200,0 cm <sup>3</sup> /rev [12.20 in <sup>3</sup> /rev]
<b>250</b>	- 250,0 cm <sup>3</sup> /rev [15.26 in <sup>3</sup> /rev]

**Pos.2 - Displacement code of the Flow Amplifier with amplifying factor k=8**

	80	100	125	160	200	250	
<b>640</b>	■						- 640,0 cm <sup>3</sup> /rev [ 39.06 in <sup>3</sup> /rev]
<b>800</b>		■					- 800,0 cm <sup>3</sup> /rev [ 48.82 in <sup>3</sup> /rev]
<b>1000</b>			■				- 1000,0 cm <sup>3</sup> /rev [ 61.02 in <sup>3</sup> /rev]
<b>1280</b>				■			- 1280,0 cm <sup>3</sup> /rev [ 78.11 in <sup>3</sup> /rev]
<b>1600</b>					■		- 1600,0 cm <sup>3</sup> /rev [ 97.64 in <sup>3</sup> /rev]
<b>2000</b>						■	- 2000,0 cm <sup>3</sup> /rev [122.05 in <sup>3</sup> /rev]

**Pos.3 - LS-Valve Pressure Settings**

<b>80</b>	- 80, bar [ 1160 PSI]
<b>100</b>	- 100, bar [ 1450 PSI]
<b>125</b>	- 125, bar [ 1810 PSI]
<b>150</b>	- 150, bar [ 2175 PSI]
<b>175</b>	- 175, bar [ 2540 PSI]

**Pos.4 - Mounting ports**

<b>4</b>	- Flow amplifier with 4 ports
<b>5</b>	- Flow amplifier with 5 ports

**Pos.5 - Ports**

omit	- BSPP (ISO 228)
<b>M</b>	- Metric
<b>A</b>	- SAE (ANSI B 1.1.-1982)

**Pos.6 - Option (Paint)\***

omit	- no Paint
<b>P</b>	- Painted
<b>PC</b>	- Corrosion Protected Paint

**Pos.7 - Design Series**

omit	- Factory specified
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## NOTES:

\* Colour at customer's request. The steering units are manganophosphatized as standard.



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