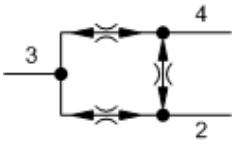
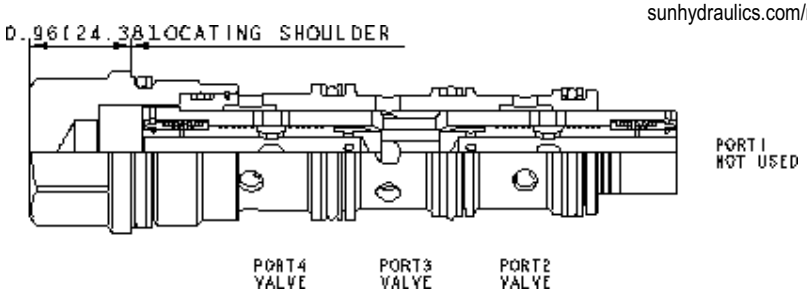
MODEL
FSES

Synchronizing, flow divider-combiner valve
SERIES 3 / CAPACITY: 23 - 120 L/min. / CAVITY: T-33A

sunhydraulics.com/model/FSES





CONFIGURATION

X	Control	Not Adjustable
A	Flow Split	50/50
N	Seal Material	Buna-N
(none)	Material/Coating	

Synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-33A
Series	3
Capacity	23 - 120 L/min.
Maximum Operating Pressure	350 bar
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	24 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006
Model Weight	0.65 kg.

CONFIGURATION OPTIONS

Model Code Example: FSESXAN

CONTROL (X)	FLOW SPLIT (A)	SEAL MATERIAL (N)	MATERIAL/COATING
X Not Adjustable	**A** 50/50	**N** Buna-N	Standard Material/Coating
		V Viton	**/AP** Stainless Steel, Passivated
			/LH Mild Steel, Zinc-Nickel

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TECHNICAL FEATURES

- All flow divider and divider/combiner cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size).
- Operating characteristics cause the leg of the circuit with the greatest load to receive the higher percentage of flow in dividing mode. If a rigid mechanism is used to tie actuators together, the lead actuator may pull the lagging actuator and cause it to cavitate.
- In combining mode, compensating characteristics will cause the leg of the circuit with the lowest load to receive the higher percentage of flow. If a synchronization feature is not included, an additive accuracy error will be experienced with each full stroke of the actuator.
- In applications involving rigid mechanisms between multiple actuators, operating inaccuracy will cause the eventual lock-up of the system. If the mechanical structure is not designed to allow for the operating inaccuracy inherent in the valve, damage may occur.
- In motor circuits, rigid frames or mechanisms that tie motors together, and/or complete mechanical synchronized motion of the output shaft of the motors, either by wheels to the pavement or sprockets to conveyors, will contribute to cavitation, lock-up and/or pressure intensification.
- Variations in speed and lock-up can be attributed to differences in motor displacement, motor leakage, wheel diameter variance and friction of wheels on the driving surface.
- Extreme pressure intensification can occur on multiple wheel drive vehicles.
- The synchronization feature provides bi-directional static error correction.
- Synchronization flow is approximately 15% of minimum rated input flow.
- Divisional and combining accuracy are equal.
- The synchronizing feature only comes into play when any one of the 3 ports is blocked. At that time, flow may occur between the other two ports.
- Below the minimum flow rating there is not enough flow for the valve to modulate. It is effectively a tee. If flow starts at zero and rises, there will be no dividing or combining control until the flow reaches the minimum rating.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variation
50:50	Max Rated	30 gpm	±2.5%	14.2 - 15.8 gpm
		120 L/min		57 - 63 L/min
	Min rated	6 gpm	±4.5%	2.7 - 3.3 gpm
		23 L/min		10,5 - 12,5 L/min
Synchronizing Flow				0,90 -1,75 gpm
				3,4 - 6,6 L/min

The maximum possible variation is at 5000 psi (350 bar) differential between legs with the high pressure leg being the higher flow in dividing mode and the lower flow in combining mode.

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