

series 557 2-Stage Servovalve Rated flows up to 60 l/m



Features

Standard & high response versions Maximum operating pressure 315 bar ISO 10372-04-04-0-92 mounting pattern Internal & external pilot supply (6 port) Suitable for 3-way or 4-way applications Low hysteresis & zero point drift High spool drive forces Spool in bushing design Dry torque motor with mechanical feedback Long life Sapphire Technology



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www.hydraustar.com

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Benefits and Features

Sapphire ball in slot design

- Incorporated into Star designs since 1988 •
- Many billions of cycles per service life
- Increased spool life due to spool rotation
- Ultra low coefficient of friction sapphire to steel
- Feedback mechanism unhindered by spool rotation •
- Extended warranties available



- Safety
- Flame proof •
- Intrinsic safety
- Class, Div & Zone coverage
- Mechanical failsafe
- Double & triple coil redundancy

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- Independant audit process is our commitment on quality
- Focus on customer needs and expectations
- Delivery schedules on time
- . Continual improvements on products and services
- Maintaining design and manufacturing integrity

Custom spool lap & bushing port geometries

- Zero overlap
- Overlap (closed center) underlap (open center)
- Dual gain
- Asymmetric gain





Sapphire flow

- Ensuring first stage stability
- Precisely matched flow properties
- . Long life in extreme environments





Special projects

- Compact servo designs
- Special interfaces
- Modular components •



Sealing materials

- Nitrile
- Fluorocarbon (Viton)
- Ethylene-Propylene
- Fluorosilicone





- MIL-C-5015
- MIL-DTL-38999
- Conduit style male/female
- Hermetic



Nominal flow ratings		4, 10, 20, 40, 60 l/mn @ 70 bar For other flow ratings contact factory		
Hysteresis		< 3% without dither		
Threshold		< 0.5% without dither		
Null bias		< 2%		
Null shif	t with 40°C temp change with 70 bar supply pressure change with return pressure 0 to 35 bar	< 2% < 2% < 2%		
Pressure gain		< 1% rated input signal for 60% of supply pressure		
Seal materials available		FPM, NBR, EPDM		
Operatin	ng temperature range	-30 °C to 130 °C		
Proof pr	essure at pressure port at return port	150% max supply pressure 100% max supply pressure		
Burst pressure return port open		250% max supply pressure		
External leakage		zero		
Degree of protection		IP 65 (BS EN 60529 : 1992)		
Weight		1 kg		
Mounting position		Any, fixed or movable		

Supply fi	Itration			
	minimum	₁₀ 75 (10 micron	abs)	
	recommended	₅ = 200 (5 micron abs)		
Fluid clea	anliness level			
	minimum recommended	ISO 4406 - 16/13 ISO 4406 - 13/10	NAS 1638 - class 7 NAS 1638 - class 4	
Supply p	ressure	0.5 k as		
	min. to effect spool movement minimum recommended maximum continuous	3.5 bar 15 bar 210 bar (FPM & EP	DM) 315 bar (NBR)	
Viscocity		VG 10 to 100 ISO 3448		
Fluid type		Petroleum based mineral oils For operation with other media contact factory		

Calculating output flow

The output flow for a given pressure drop can be calculated using the following:

$$q = q_N \sqrt{\frac{p_N}{p_V}}$$

Where:

q = Output flow [l/min]

 $q_{\rm N}$ = Rated flow [l/min]

 p_{N} = Valve pressure drop [bar]

 p_{V} = Rated valve pressure drop [bar]



Output flow versus input signal at constant valve pressure drop



The flow tolerance for standard servovalves is $\pm 10\%$ of the nominal rated flow at $\pm 100\%$ input signal.

The rated flow is quoted at 70 bar p and 100% rated input signal.

Internal leakage

This comprises of both pilot stage flow (tare leakage) and the second stage null leakage, typical values for this size of valve would be:

Rated flow	Internal leakage at 140 bar	
4 l/min	< 1.0 l/min	
10 l/min	< 1.2 l/min	
20 l/min	< 1.6 l/min	
40 l/min	< 1.6 l/min	
60 l/min	< 1.6 l/min	
75 l/min	< 1.6 l/min	

Coil schematics



Series connection

Output flow polarity Flow in the direction of $P \Rightarrow C2$, $C1 \Rightarrow R$ will occur with the pilot stage coils configured as above.



Parallel connection

Coil options

Coil specification		Series connection		Parallel connection	
Rated signal [mA]	Resistance per coil []	Input current [mA]	Effective resistance []	Input current [mA]	Effective resistance []
10	1000	5	2000	10	500
15	200	7.5	400	15	100
20	1200	10	2400	20	600
30	300	15	600	30	150
30	800	15	1600	30	400
40	80	20	160	40	40
60	40	30	80	60	20
80	22	40	44	80	11
100	27	50	54	100	13.5
200	22	100	44	200	11

Electrical connection Standard connector is MS3102E-14S-2P (MIL-C-5015). Please contact factory for more options.









Input signal = 100% [1] Rated flow = 4 l/min [2] Rated flow = 60 l/min Supply pressure = 210 bar

80 100

Transient Response (MR)



0

200

2

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0

60

80 100







40

0

-2

-4

-6

-8

-10

-12

5

10

20

Amplitude ratio [dB]

Input signal = 100% [1] Rated flow = 4 l/min [2] Rated flow = 40 l/min Supply pressure = 210 bar

Frequency Response (HR)

Transient Response (HR)





1. Suggested mounting bolts M8 x 60 long high tensile steel socket head cap screws.

2. 4-way electrical connector mates with MS3106-14S-2S or equivalent. Is available at \pm 90° and 180° to position shown (advise desired position at time of order).

3. Base O-Rings: 10.82 I/D x 1.78 section (5 pcs). 4.47 I/D x 1.78 section (1 pc).

4. Null adjust requires 10 A/F ring spanner and 2.5 hexagon key. Flow out of C2 will increase with clockwise rotation of key.

Installation Details Model 557

Dimensions in millimeters 3rd angle projection Filename

0.8 0.02 Surface to which valve is mounted

