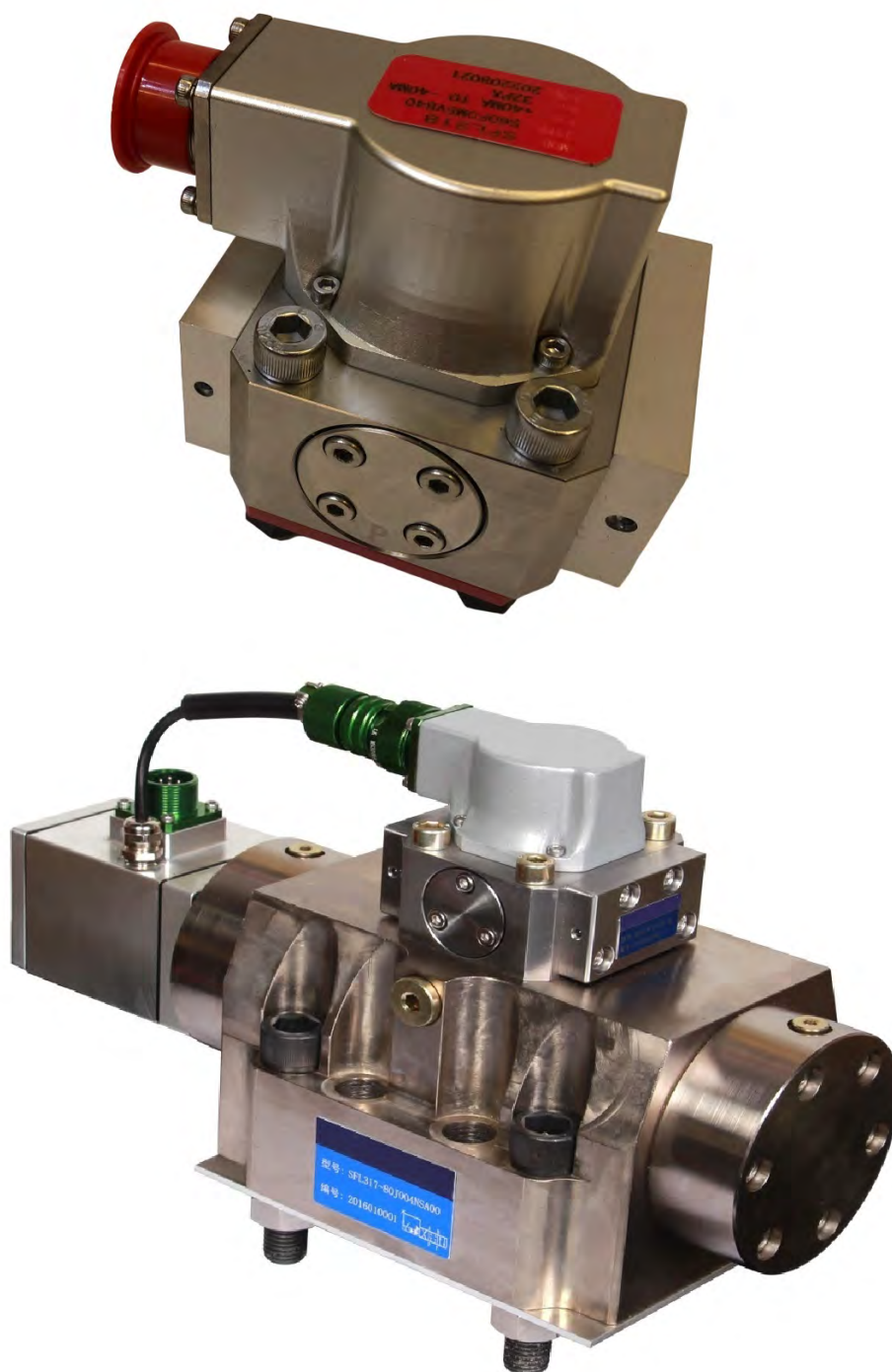


Электрогидравлические сервоклапаны



ООО «АЛЬКОР ПЛЮС»

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Technical term**Rated current**

Input current of any polarity (excluding zero bias current) specified for generating rated flow, represented by the symbol I_n , and the unit is mA. Usually the rated current is for single-coil connection, differential connection or parallel connection. When working in series connection, its rated current is half of the above-mentioned rated current.

Zero value current

For coils connected differentially, the DC current flowing through each coil when the differential current is zero. Since the polarities of the two coil currents are opposite, the electrical control power is zero.

Overload current

The maximum allowable current flowing through the torque motor coils. The recommended overload current is twice the rated current flowing through the torque motor coils.

Coil resistor

The DC resistance of a single coil of a torque motor in Ω .

Coil inductance

The inductive component of the coil impedance, in H. The inductance of the coil is usually related to the oil supply pressure, input current amplitude and frequency, and it is specified to be measured under the conditions of rated oil supply pressure, control current frequency of 60Hz, and peak-to-peak value of 25% I_n .

Rated flow

Under the condition of rated oil supply pressure, the control flow output corresponding to the rated current is expressed by the symbol Q_n , and the unit is L/min. Usually, the rated flow rate is specified as the no-load flow rate corresponding to the rated current when the valve pressure drop is equal to the rated oil supply pressure.

Flow gain

In the specified working area, the slope of the flow curve, the unit is L/(min·mA)

Endoleak

Under the rated oil supply pressure, when the control flow is zero, the flow out from the oil return window, the unit is L/min. It changes with the change of the control current, and the maximum value is taken as the internal leakage.

Hysteresis loop

When the input current circulates between the positive and negative rated currents at a speed less than that of the dynamic characteristics, the maximum value of the difference between the input currents that produce the same control flow to and from the return, the ratio of the rated current to the rated current, expressed as a percentage.

Non-linearity

The non-straightness of the flow curve is expressed as a percentage by the ratio of the maximum deviation between the nominal flow curve and the nominal flow gain line to the rated current.



Asymmetric degree

Inconsistency in flow gain for both polarities. Take the ratio of the difference between the polarity nominal flow gains to the larger one, expressed as a percentage.

Overlap

The axial positional relationship between the fixed and movable throttling edges when the spool valve is at zero position. For the servo valve, the overlapping measurement method is: for each polarity, make the extension line of the nominal flow curve approximate to the straight line part, and the total interval current between the zero flow points of the two extension lines is expressed as a percentage of the rated current .

Pressure Gain

When the control flow is zero, the change rate of the load pressure drop to the input current, the unit is MPa/mA. It is usually specified as the average slope of the load voltage drop versus input current curve between $\pm 40\%$ of the maximum load voltage drop. When the commonly used servo valve is at zero position, the input current changes by 1% of the rated current, and the load pressure drop corresponding to the rated oil supply pressure is expressed as a percentage.

Zero bias

The ratio of the input current required to make the valve return to zero (without considering the effect of hysteresis) to the rated current, expressed as a percentage.

Resolution

The smallest increment of input current that causes a change in the valve's controlled flow. It varies with the input current and the dwell time. Take the ratio of the maximum value to the rated current and express it as a percentage.

Frequency response

When the input current changes sinusoidally within a certain frequency range, the complex ratio of the no-load control flow to the input current. Typically measured with constant input current amplitude and zero load voltage drop. Expressed as a logarithmic frequency characteristic. It is measured by amplitude bandwidth and phase bandwidth.

Hydraulic properties

Oil supply pressure

- (1) The servo valve can work normally within the range of oil supply pressure (2-35) MPa;
- (2) The performance given in the sample is measured at 21MPa except for the rated flow rate;
- (3) Except for direct-acting valves, the resolution and dynamic response of other types of servo valves become worse as the oil supply pressure decreases;
- (4) If the servo valve does not work under the rated pressure, the zero offset will change;
- (5) Under the oil supply pressure other than the rated pressure, the actual flow rate of the servo valve is calculated according to the following formula:

$$Q = Q_n \sqrt{\frac{P}{P_n}}$$

Q — The actual flow rate when the oil supply pressure is P ;

Q_n — Limited Data;

P — Actual oil supply pressure;

P_n — Rated oil supply pressure.

Oil return pressure

- (1) Oil return pressure can vary within a certain range (generally no more than 5MPa), but changes in oil return pressure will cause zero drift of the servo valve;
- (2) The oil return pressure is not allowed to be greater than the oil supply pressure, so as to prevent the liquid flow from flowing backward to the hydraulic amplification stage.

Pressure resistance and burst pressure

(1) Pressure resistance

Oil inlet and load window=1.5Pn

Oil return window=1.0Pn

(2) Destruction pressure

Oil inlet and load window=2.5Pn

Oil return window=1.5Pn or maximum 35MPa

Working fluid and corresponding sealing material

- (1) Petroleum-based hydraulic oil - nitrile rubber/fluoro rubber;
- (2) Aviation kerosene - nitrile rubber/fluoro rubber;
- (3) Phosphate ester - EPDM rubber.

Pollution degree of working fluid

The pollution degree of the working fluid should be better than NAS1638-6 grade, worse than NAS1638-6 grade will affect the service life of the servo valve.

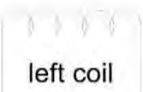
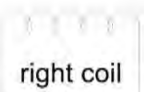
Electrical characteristics

Plug socket

- (1) Usually the supply is a general electrical socket as shown in the outline drawing, and a special socket can also be provided according to the user's requirements;
- (2) There are four positions for the plug seat to choose from. If the user has no special requirements, the position of the plug seat is according to the outline drawing.

Coil/Socket Connection

The connection between the coil lead wire and the socket is as shown in the figure below:

torque motor coil					
		left coil		right coil	
Coil Lead Color	red	black	yellow	green	
socket pin marking	1 (A)	2 (B)	3 (C)	4 (D)	

Chatter

- (1) Definition: In order to improve the characteristics of the servo valve, the oscillation is added to the input signal;
- (2) The performance of the servo valve given in this catalog is measured under the condition of no flutter;
- (3) Adding flutter can improve the hysteresis and resolution of the servo valve, but it will increase the internal leakage;
- (4) The flutter frequency is generally (100-400) Hz, and the amplitude (peak-to-peak value) is (10-20) %In.

Servo Amplifier

- (1) Definition: An amplifier that receives instructions and outputs the current required by the servo valve torque motor coil;
- (2) The servo amplifier should adopt deep current negative feedback to eliminate the servo valve gain change caused by the servo valve coil impedance change and phase lag.

Static Characteristics

Polarity

- (1) Specify the positive polarity of the input current

Single coil: 1(A)+, 2(B) - ; 3(C)+, 4(D) - ;

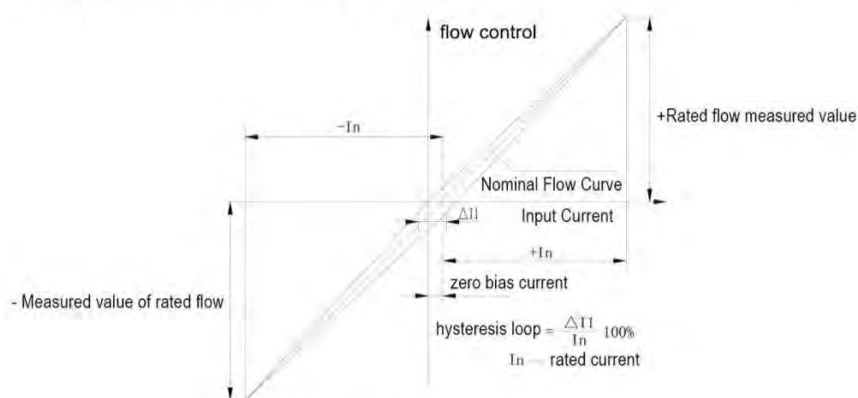
Coils in series: 1(A)+, 4(D)-; 2(B) connected to 3(C);

Parallel coils: 1(A) is connected to 3(C)+, 2(B) is connected to 4(D)-.

- (2) Definition: When positive polarity current is input, the flow direction of "P→2(B), 1(A)→R(T)" is defined as positive flow polarity.

No-load flow characteristics

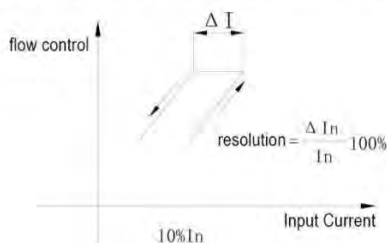
- (1) Definition: measured when the load window is open (no load);
- (2) The rated flow rate, hysteresis, zero bias, nonlinearity, asymmetry and other indicators of the servo valve can be obtained from the no-load flow curve;
- (3) Zero overlap ($\pm 2.5\%$) servo valve is in the zero position area of $\pm 3\%$, and the flow gain variation range is (50~200)% nominal flow gain.



No-load flow characteristic curve

Resolution

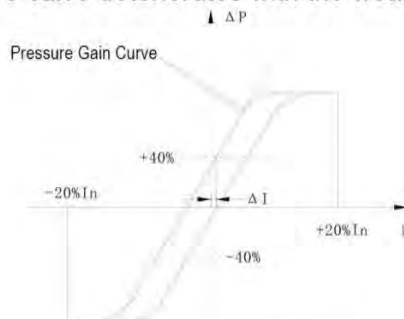
- (1) Definition: measured near zero ($10\%I_n$);
- (2) The resolution of the servo valve becomes worse with the decrease of the oil supply pressure, the wear of the working edge and the aggravation of the pollution of the working fluid.



Resolution Curve

Pressure Characteristics

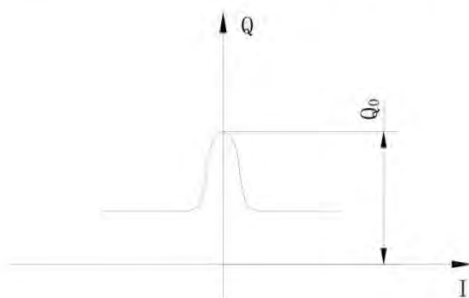
- (1) Definition: Measured in the zero position area of the servo valve and under the condition that the load window is closed;
- (2) The pressure gain and zero bias of the servo valve can be obtained from the pressure characteristic curve;
- (3) The pressure gain of the servo valve deteriorates with the wear of the working edge.



Pressure Characteristic Curve

Endoleak Characteristics

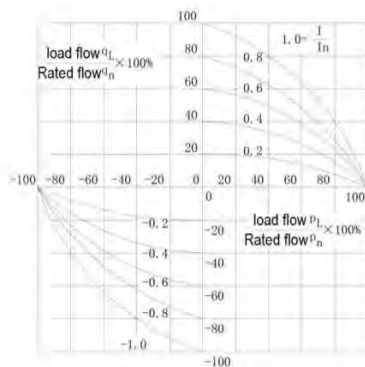
- (1) Definition: Measured under load window off condition;
- (2) The internal leakage, zero leakage and constant value leakage of the servo valve can be obtained from the internal leakage characteristic curve;
- (3) The zero leakage of the servo valve increases with the wear of the working edge.



Endoleak characteristic curve

Load characteristics

- (1) Definition: Under the given oil supply pressure and different input signals, change the load pressure drop measurement;
- (2) The operating point of the servo valve can be obtained from the load characteristic curve.



Load Characteristic Curve

Zero bias

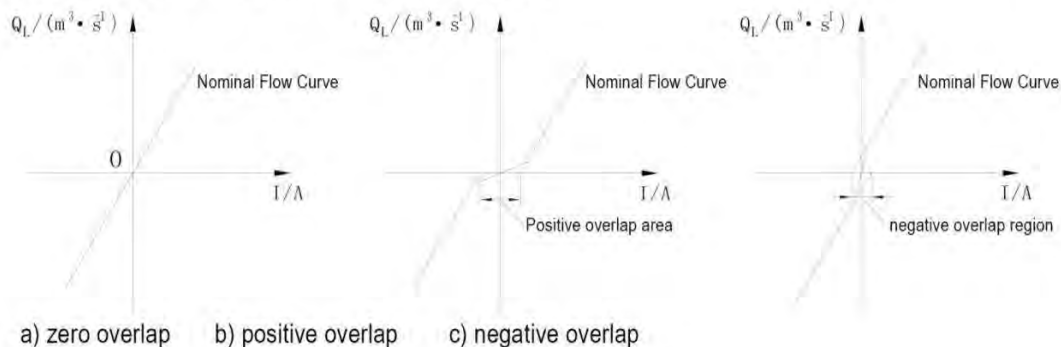
(1) The zero offset is measured after eliminating the hysteresis of the servo valve under standard test conditions;

(2) The zero deviation of the servo valve is allowed to increase to 6% during the service period.

Overlapping

(1) The servo valve defaults to zero overlap, and the actual overlap is within $\pm 2.5\%$ of the rated current;

(2) Positive overlap of the servo valve: the zero flow gain decreases, the pressure gain becomes worse, and the zero leakage decreases;



Dynamic Characteristics

Transfer Function

(1) When the bandwidth of the selected servo valve is much higher than the operating frequency of the system, the following function can be referred to when calculating the system dynamics:

(2) When the bandwidth of the selected servo valve is equivalent to the operating frequency of the system, the following function can be referred to when calculating the system dynamics:

(3) Negative overlap of the servo valve: the zero flow gain increases, the pressure gain decreases, and the zero leakage increases.

$$\frac{Q}{I}(s) = \frac{K}{\left(\frac{s}{\omega}\right)^2 + \frac{2\xi}{\omega}s + 1}$$

Q — Output flow (L/min)

I — Input current (mA)

K — Servo valve flow gain [L/(min·mA)]

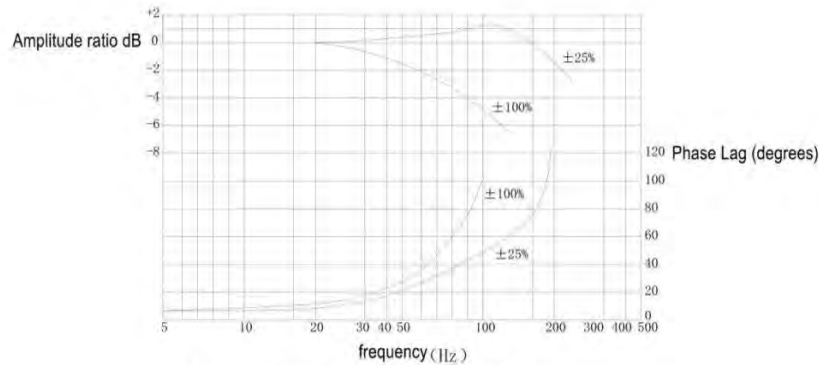
T — Servo valve time constant (sec)

ω — The natural frequency of the servo valve as a second-order link (rad/s)

ξ — The damping coefficient of the servo valve as a second-order link

Frequency Characteristic

- (1) Definition: measured when the load is turned on (no load), given oil supply pressure, and different input signals;
- (2) The amplitude bandwidth and phase bandwidth of the servo valve can be obtained from the frequency characteristic curve;
- (3) The frequency response amplitude ratio of the servo valve should not be greater than +2dB.



Frequency Characteristic Curve

Terms and Conditions

- (1) The surface roughness of the servo valve mounting base should be better than , and the flatness should be less than 0.01mm.
- (2) When installing the servo valve, the surface of the installation base should be cleaned and no dirt is allowed. Avoid installing the servo valve in
If it has to be installed on a machine part with strong vibration or a drastic change in motion, the axial direction of the valve core should also be adjusted.
consistent with the movement direction of the machine.
- (3) Since the torque motor is equipped with permanent magnets, there should be no strong electromagnetic interference field near the servo valve.
- (4) The oil tank should be sealed, and an oil filter with an absolute filtration accuracy of $\leq 10 \mu\text{m}$ should be installed in front of the oil supply port of the servo valve.
The cleaning block is circulated until the pollution degree of the working fluid meets the requirements before the servo valve can be installed.
- (5) In addition to meeting the pollution degree, the hydraulic source should also meet the following requirements:

The pressure pulsation amplitude of the hydraulic source should be as small as possible, because a large pressure pulsation amplitude may easily cause servo failure under certain conditions.

The service valve squeals and may rupture the spring tube of the torque motor.

The hydraulic source must have a good cooling system. During the working process, the oil temperature should be controlled within a certain range.

If the temperature changes greatly, or the oil temperature is too high, it will affect the performance and service life of the servo valve.

If the hydraulic source adopts a constant pressure variable pump, the oil source system should use a larger-capacity charge accumulator, because the system works
When operating, the instantaneous flow rate of the servo valve changes greatly. This change in flow rate cannot be instantly supplemented by the variable pump, but by the energy storage.
refill.

SFL212 Double nozzle baffle two-stage electro-hydraulic servo valve



□ Features

- Two-stage servo valve, flow control
- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- Mechanical feedback
- High resolution, low hysteresis, excellent performance, high dynamic response
- Suitable for closed-loop control of position, force and velocity
- Compact structure, small size and light weight

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure ($\geq 2\text{MPa}$) when the system starts
Weight	k g	1.3

Technical Parameters

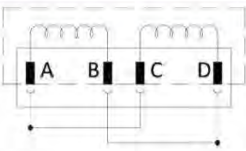
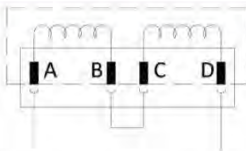
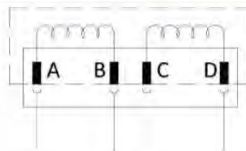
Work Pressure				
Oil mouth P, A, B	MPa	≤ 31.5		
Oil mouth T	MPa	≤ 21		
Rated flow (differential pressure $\Delta P = 7\text{MPa}$)	L/min	5	10	20
Zero bias	%	$\leq \pm 2$		
Hysteresis loop	%	≤ 4		
Resolution	%	≤ 1		
Non-linearity	%	≤ 7.5		
Asymmetry	%	≤ 7.5		
Endoleak	L/min	≤ 0.8	≤ 1	≤ 2
Pressure Gain	%Pn/1%In	≥ 30		
Oil supply pressure zero drift (80~110%Pn)	%	$\leq \pm 2$		

Oil return pressure zero drift	%	$\leq \pm 2$
Temperature zero drift (every 40°C change in temperature) %		$\leq \pm 2$
Amplitude bandwidth	Hz	≥ 100
Phase bandwidth	Hz	≥ 100
Valve body structure	Four-way, two-stage servo valve with spool and sleeve	
Pilot stage	Nozzle Flapper Valves	
Pilot oil supply method	Internal supply control oil, internal oil return	
Pilot Oil Filtration	With internal oil filter	

Electrical Parameters

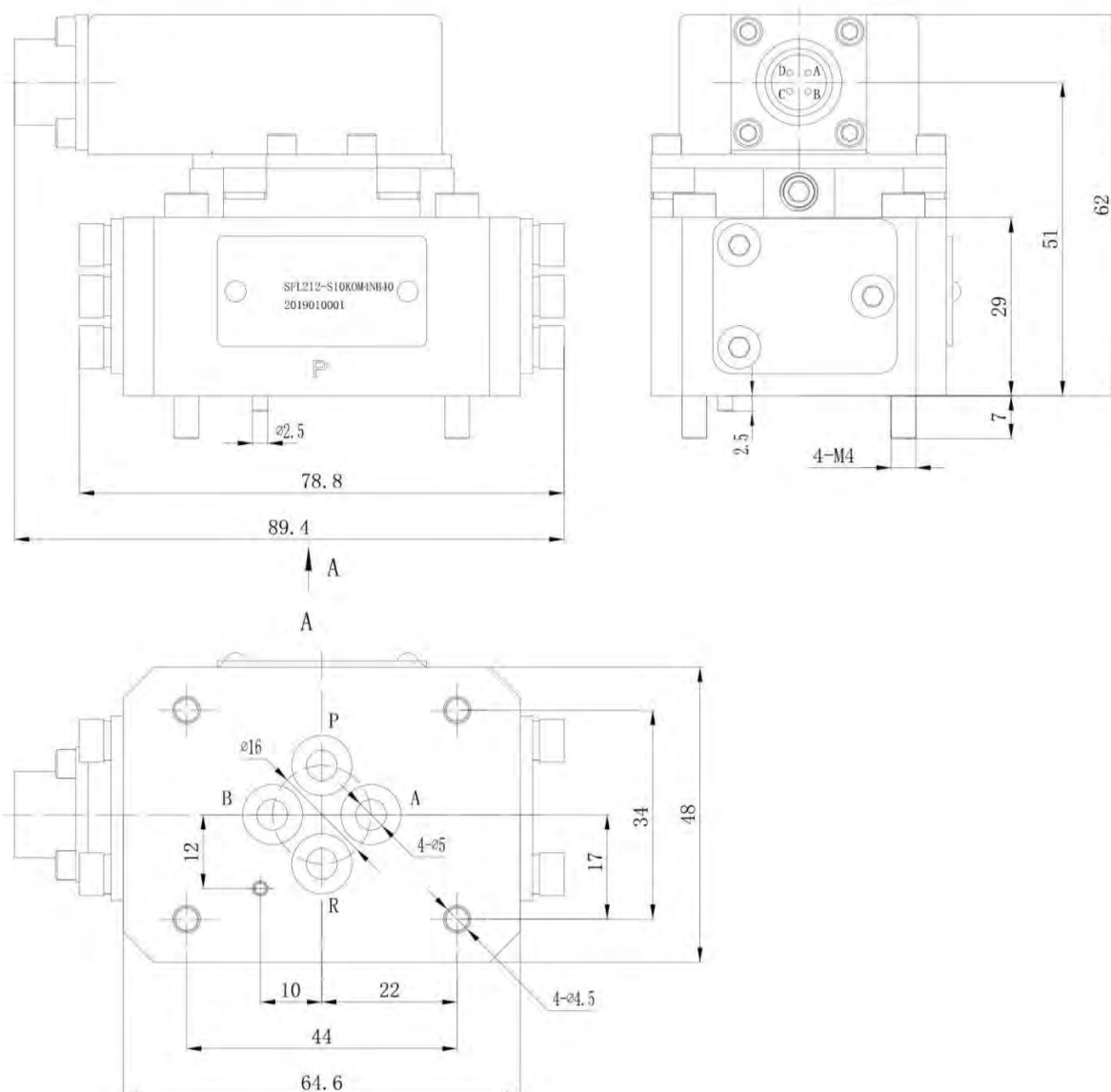
Valve protection type according to standard EN 60 529	IP65
Signal type	Analog quantity
Rated current per coil	m A 40
Each coil resistance	Ω 100 (according to user needs)
Socket	Standard electrical socket, mates with HB6 - 77 - 83 plug or other equivalent
Servo Amplifier	External servo amplifier (Model: HTSA101, ordered separately)

□ Electrical Wiring

	Parallel connection	In series	Single Coil
Coil connection form			
Coil resistor (Ω)	50	200	100
Rated current (mA)	40	20	40
Coil inductance (H)	0.5	2	1
Input polarity when valve is at P→B, A→T	A and C (+), B and D (-)	A (+), D (-), B, C are shorted	A(+), B(-), or C(+), D(-)

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ Dimensions and Interface



- The roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	6.3×1.8	4
Configuration plug (degree of protection IP65)	HB6 - 77 - 83 plug	1
Mounting screw	M4×35	4
Protective base	PP or 2A12	1

□ **Ordering Information**

SFL212 —

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SFL212B Double nozzle baffle two-stage electro-hydraulic servo valve



□ Features

- Two-stage servo valve, flow control
- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- Mechanical feedback
- High resolution, low hysteresis, excellent performance, high dynamic response
- Suitable for closed-loop control of position, force and velocity
- Compact structure, small size and light weight

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure ($\geq 2\text{MPa}$) when the system starts
Weight	k g	1.3

Technical Parameters

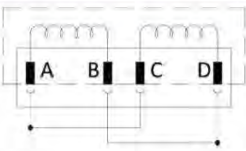
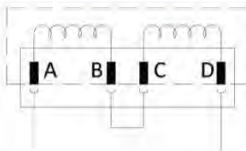
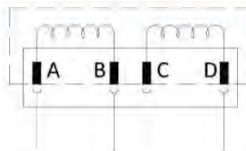
Work Pressure				
Oil mouth P, A, B	MPa	≤ 31.5		
Oil mouth T	MPa	≤ 21		
Rated flow (differential pressure $\Delta P = 7\text{MPa}$)	L/min	5	10	20
Zero bias	%	$\leq \pm 2$		
Hysteresis loop	%	≤ 4		
Resolution	%	≤ 1		
Non-linearity	%	≤ 7.5		
Asymmetry	%	≤ 7.5		
Endoleak	L/min	≤ 0.8	≤ 1	≤ 2
Pressure Gain	%Pn/1%In	≥ 30		
Oil supply pressure zero drift (80~110%Pn)	%	$\leq \pm 2$		

Oil return pressure zero drift	%	$\leq \pm 2$
Temperature zero drift (every 40°C change in temperature) %		$\leq \pm 2$
Amplitude bandwidth	Hz	≥ 100
Phase bandwidth	Hz	≥ 100
Valve body structure	Four-way, two-stage servo valve with spool and sleeve	
Pilot stage	Nozzle Flapper Valves	
Pilot oil supply method	Internal supply control oil, internal oil return	
Pilot Oil Filtration	With internal oil filter	

Electrical Parameters

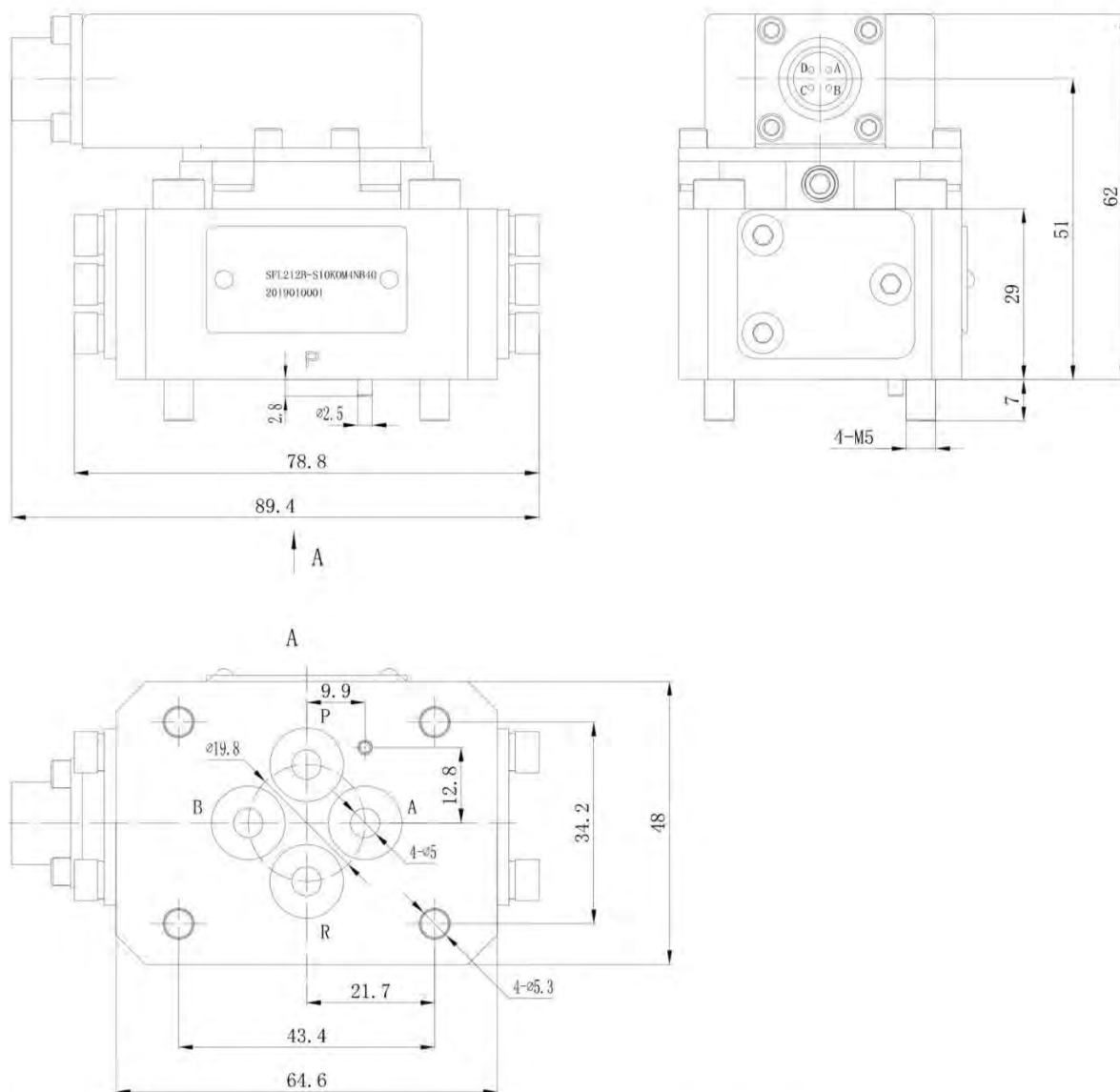
Valve protection type according to standard EN 60 529	IP65
Signal type	Analog quantity
Rated current per coil	m A 40
Each coil resistance	Ω 100 (according to user needs)
Socket	Standard electrical socket, mates with HB6 - 77 - 83 plug or other equivalent
Servo Amplifier	External servo amplifier (Model: HTSA101, ordered separately)

□ Electrical Wiring

	Parallel connection	In series	Single Coil
Coil connection form			
Coil resistor (Ω)	50	200	100
Rated current (mA)	40	20	40
Coil inductance (H)	0.5	2	1
Input polarity when valve is at P→B, A→T	A and C (+), B and D (-)	A (+), D (-), B, C are shorted	A(+), B(-), or C(+), D(-)

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ Dimensions and Interface



— The roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.

— In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	9×1.8	4
Configuration plug (degree of protection IP65)	HB6 - 77 - 83 plug	1
Mounting screw	M5×35	4
Protective base	PP or 2A12	1



□ Ordering Information

SFL212B —

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Valve response type	
S	Standard Responses
H	High frequency

Rated flow	
When Pn=3.5MPa per section Qn[L/min]	
05	5
10	10
20	20

Maximum Working Pressure and Body Material			
F	21	MPa	Aluminum shell
K	35	MPa	Steel shell

Valve Spool Type	
O	Four-way, zero opening, linear flow gain
A	Four-way, 1.5% ~ 3% positive overlap, linear gain
D	Four-way, 10% positive overlap, linear gain
X	Customized on demand

Signal current for fully open valve			
10	±10	mA	Parallel connection
15	±15	mA	Parallel connection
40	±40	mA	Parallel connection
Customized on demand			

Valve Socket	
A	The socket is facing the A port
B	The socket is facing the B port
P	The socket is facing the P port
T	The socket is facing the T port

Seal material	
N	Nitrile Rubber (NBR) Standard Type
V	Viton (FPM)
Customized on demand	

Pilot valve control oil	
4	Internal Control

The position of the spool when there is no control electric signal	
M	Centre position
A	P→B, A→T
B	P→A, B→T

SFL212B (FB) double nozzle baffle explosion-proof servo valve



□ Features

- Intrinsically safe, explosion-proof grade: Exib II C T4 Gb
- Passed explosion-proof certification, in line with GB3836.1-2010, GB3836.4 - 2010
- Product shell protection grade: IP66
- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- Excellent performance, high dynamic response
- Suitable for closed-loop control of position, force and velocity

□ Main Parameter

General parameters		
Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio β ₅ ≥75
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure (≥2MPa) when the system starts
Weight	k g	1.3

Technical Parameters

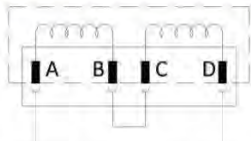
Work Pressure			
Oil mouth P, A, B	MPa	≤31.5	
Oil mouth T	MPa	≤21	
Rated flow (differential pressure ΔP=7MPa)	L/min	5	10 20
Zero bias	%	≤±2	
Hysteresis loop	%	≤4	
Resolution	%	≤1	
Non-linearity	%	≤7.5	
Asymmetry	%	≤7.5	
Endoleak	L/min	≤0.8	≤1 ≤2
Pressure Gain	%Pn/1%In	≥30	
Oil supply pressure zero drift (80~110%Pn)	%	≤±2	

Oil return pressure zero drift	%	$\leq \pm 2$
Temperature zero drift (every 40°C change in temperature) %		$\leq \pm 2$
Amplitude bandwidth	Hz	≥ 100
Phase bandwidth	Hz	≥ 100
Valve body structure		Four-way, two-stage servo valve with spool and sleeve
Pilot stage		Nozzle Flapper Valves
Pilot oil supply method		Internal supply control oil, internal oil return
Pilot Oil Filtration		With internal oil filter

Electrical Parameters

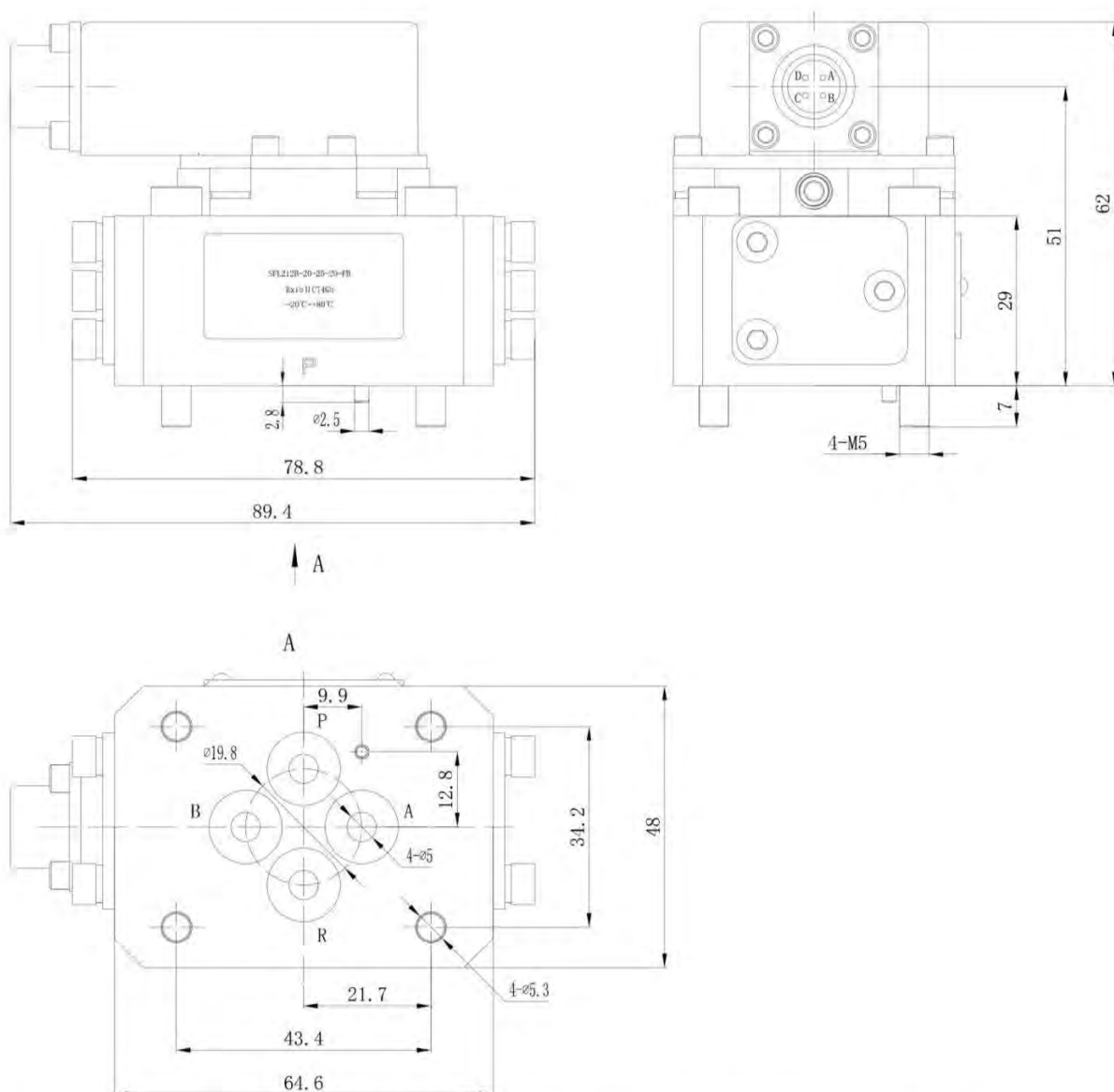
Enclosure protection class		IP66
Signal type		Analog quantity
Rated current of single coil	mA	20
Maximum Input Current	mA	35
Single coil resistance	Ω	270 (Custom coil resistance)
Rated voltage	V	5.48
Maximum Input Voltage	V	9.5
Rated power	W	0.11
Maximum input power	W	0.33
Maximum Coil Capacitance	pF	13.1
Socket		Standard electrical socket, mates with HB6 - 77 - 83 plug or other equivalent
Servo Amplifier		External (model: HTSA101, ordered separately)

□ Electrical Wiring

Main parameter	Technical indicators
Coil Wiring	
Coil connection form	Series connection
Coil resistor	Ω 270
Rated current	mA 20
Coil inductance	mH 9.5
Input polarity when valve is at P→B, A→T	A (+), D (-), B, C short circuit

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ Dimensions and Interface



— The roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.

— In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	9×1.8	4
Configuration plug (degree of protection IP66)	HB6 - 77 - 83 plug	1
Mounting screw	M5×35	4
Protective base	PP or 2A12	1

□ Ordering Information

SFL212B —

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Rated flow			
When Pn=3.5MPa per section Qn[L/min]			
05	5		
10	10		
20	20		

Maximum Working Pressure and Body Material			
25	25	MPa	Aluminum shell
35	35	MPa	Steel shell

Special function		
FB	Explosion-proof	

Current signal (series connection)		
20	20	mA

SFL214 Double nozzle baffle two-stage electro-hydraulic servo valve



□ Features

- Two-stage servo valve, flow control
- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- Mechanical feedback
- Excellent performance, high dynamic response
- Suitable for closed-loop control of position, force and velocity
- Can be used as a 3-way valve
- Optional fifth port for separate pilot control

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure ($\geq 2\text{MPa}$) when the system starts
Weight	k g	3.7

Technical Parameters

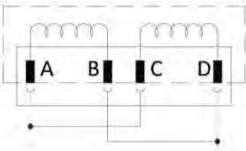
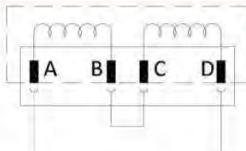
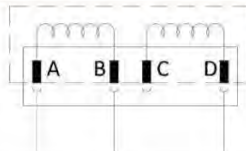
Work Pressure		
Oil mouth P, A, B	MPa	≤ 31.5
Oil mouth T	MPa	≤ 21
Rated flow (differential pressure $\Delta P = 7\text{MPa}$)	L/min	100 150
Zero bias	%	$\leq \pm 2$
Hysteresis loop	%	≤ 4
Resolution	%	≤ 1
Non-linearity	%	≤ 10
Asymmetry	%	≤ 10
Endleak	L/min	≤ 6
Pressure Gain	%Pn/1%In	≥ 30
Oil supply pressure zero drift (80~110%Pn)	%	$\leq \pm 2$

Oil return pressure zero drift	%	$\leq \pm 2$
Temperature zero drift (every 40°C change in temperature) %		$\leq \pm 2$
Amplitude bandwidth	Hz	≥ 40
Phase bandwidth	Hz	≥ 50
Valve body structure	Four-way, two-stage servo valve with spool and sleeve	
Pilot stage	Nozzle Flapper Valves	
Pilot oil supply method	Internal supply control oil, internal oil return	
Pilot Oil Filtration	With internal oil filter	
Installation form	ISO 10372-06-05-0-92	

Electrical Parameters

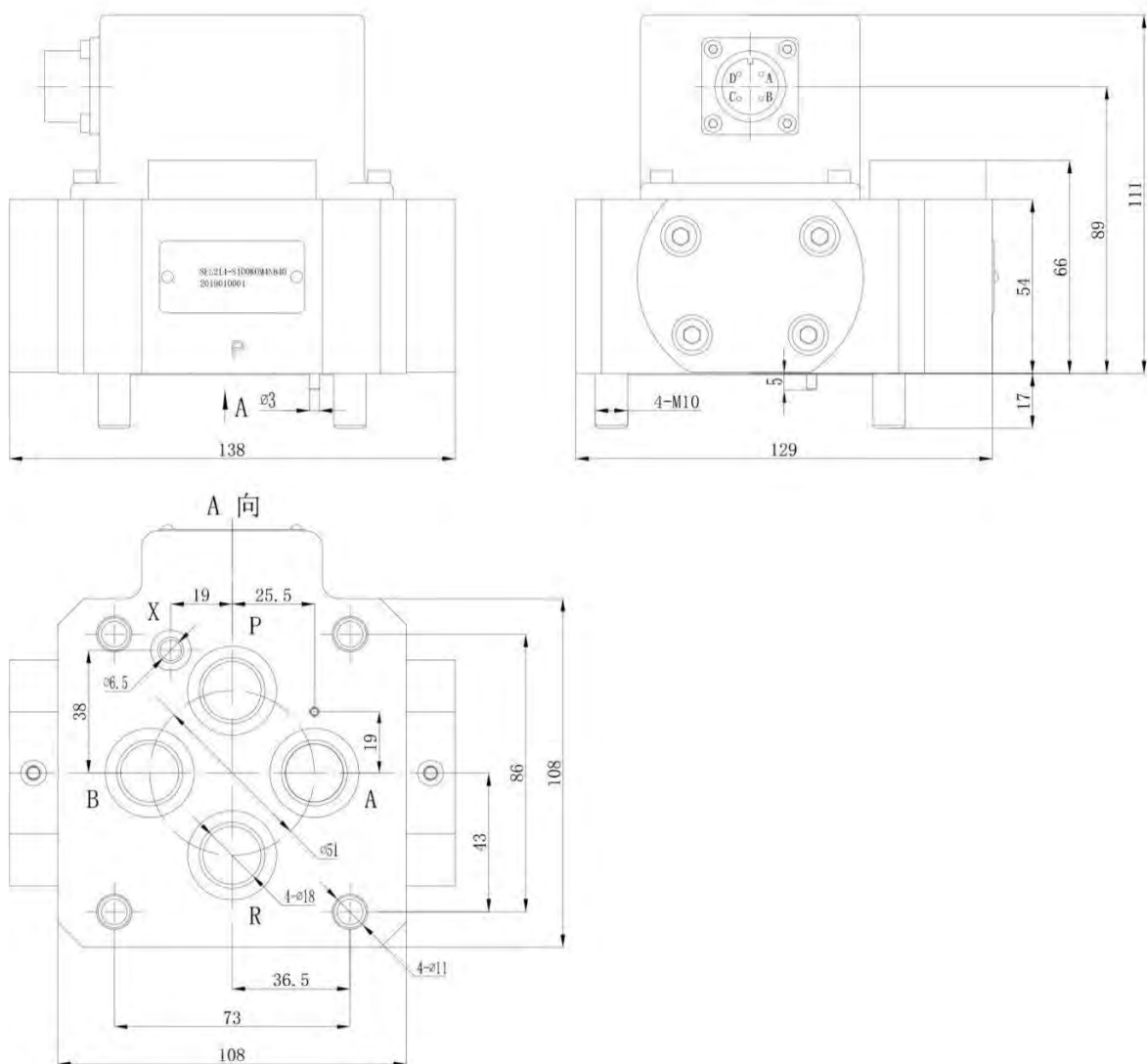
Valve protection type according to standard EN 60 529	IP65
Signal type	Analog quantity
Rated current per coil	m A 40
Each coil resistance	Ω 80 (according to user needs)
Socket	Standard electrical receptacle, mates with MS3106F14S-2S or other equivalent plug
Servo Amplifier	External servo amplifier (Model: HTSA101, ordered separately)

□ Electrical Wiring

	Parallel connection	In series	Single Coil
Coil connection form			
Coil resistor (Ω)	40	160	80
Rated current (mA)	40	20	40
Coil inductance (H)	0.36	1.44	0.72
Input polarity when valve is at P→B, A→T	A and C (+), B and D (-)	A (+), D (-), B, C are shorted	A(+), B(-), or C(+), D(-)

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ Dimensions and Interface



- The installation surface of the valve complies with ISO10372 - 06 - 05 - 0 - 92, the roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	22.4×2.65	4
For X ports	9×1.8	1
Configuration plug (degree of protection IP65)	14S2S	1
Mounting screw	M10×60	4
Protective base	PP or 2A12	1

Ordering Information

SFL214 — • • • • • • • • •

Valve response type	
S	Standard Responses

Rated flow	
When Pn=3.5MPa per section Qn[L/min]	
100	100
150	150

Maximum Working Pressure and Body Material			
F	21	MPa	Aluminum shell
K	35	MPa	Steel shell

Valve Spool Type	
O	Four-way, zero opening, linear flow gain
A	Four-way, 1.5% ~ 3% positive overlap, linear gain
D	Four-way, 10% positive overlap, linear gain
X	Customized on demand

The position of the spool when there is no control electric signal	
M	Centre position
A	P→B, A→T
B	P→A, B→T

Signal current for fully open valve			
15	±15	mA	Parallel connection
40	±40	mA	Parallel connection
80	±80	mA	Parallel connection
Customized on demand			

Valve Socket	
A	The socket is facing the A port
B	The socket is facing the B port
P	The socket is facing the P port
T	The socket is facing the T port

Seal material	
N	Nitrile Rubber (NBR) Standard Type
V	Viton (FPM)
Customized on demand	

Pilot valve control oil	
4	Internal Control
5	External control

SFL216 Double nozzle baffle two-stage electro-hydraulic servo valve



□ Features

- Two-stage servo valve, flow control
- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- Mechanical feedback
- Excellent performance, high dynamic response
- Suitable for closed-loop control of position, force and velocity
- Can be used as a 3-way valve
- Optional fifth port for separate pilot control

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure ($\geq 2\text{MPa}$) when the system starts
Weight	k g	5.3

Technical Parameters

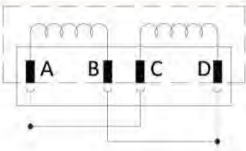
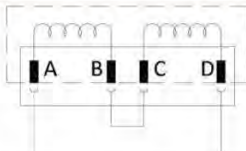
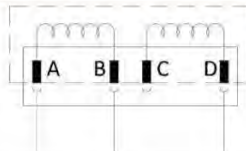
Work Pressure		
Oil mouth P, A, B	MPa	≤ 31.5
Oil mouth T	MPa	≤ 21
Rated flow (differential pressure $\Delta P = 7\text{MPa}$)	L/min	230
Zero bias	%	$\leq \pm 2$
Hysteresis loop	%	≤ 4
Resolution	%	≤ 1
Non-linearity	%	≤ 10
Asymmetry	%	≤ 10
Endleak	L/min	≤ 10
Pressure Gain	%Pn/1%In	≥ 30
Oil supply pressure zero drift (80~110%Pn)	%	$\leq \pm 2$

Oil return pressure zero drift	%	$\leq \pm 2$
Temperature zero drift (every 40°C change in temperature) %		$\leq \pm 2$
Amplitude bandwidth	Hz	≥ 30
Phase bandwidth	Hz	≥ 35
Valve body structure	Four-way, two-stage servo valve with spool and sleeve	
Pilot stage	Nozzle Flapper Valves	
Pilot oil supply method	Internal supply control oil, internal oil return	
Pilot Oil Filtration	With internal oil filter	
Installation form	ISO 10372-06-05-0-92	

Electrical Parameters

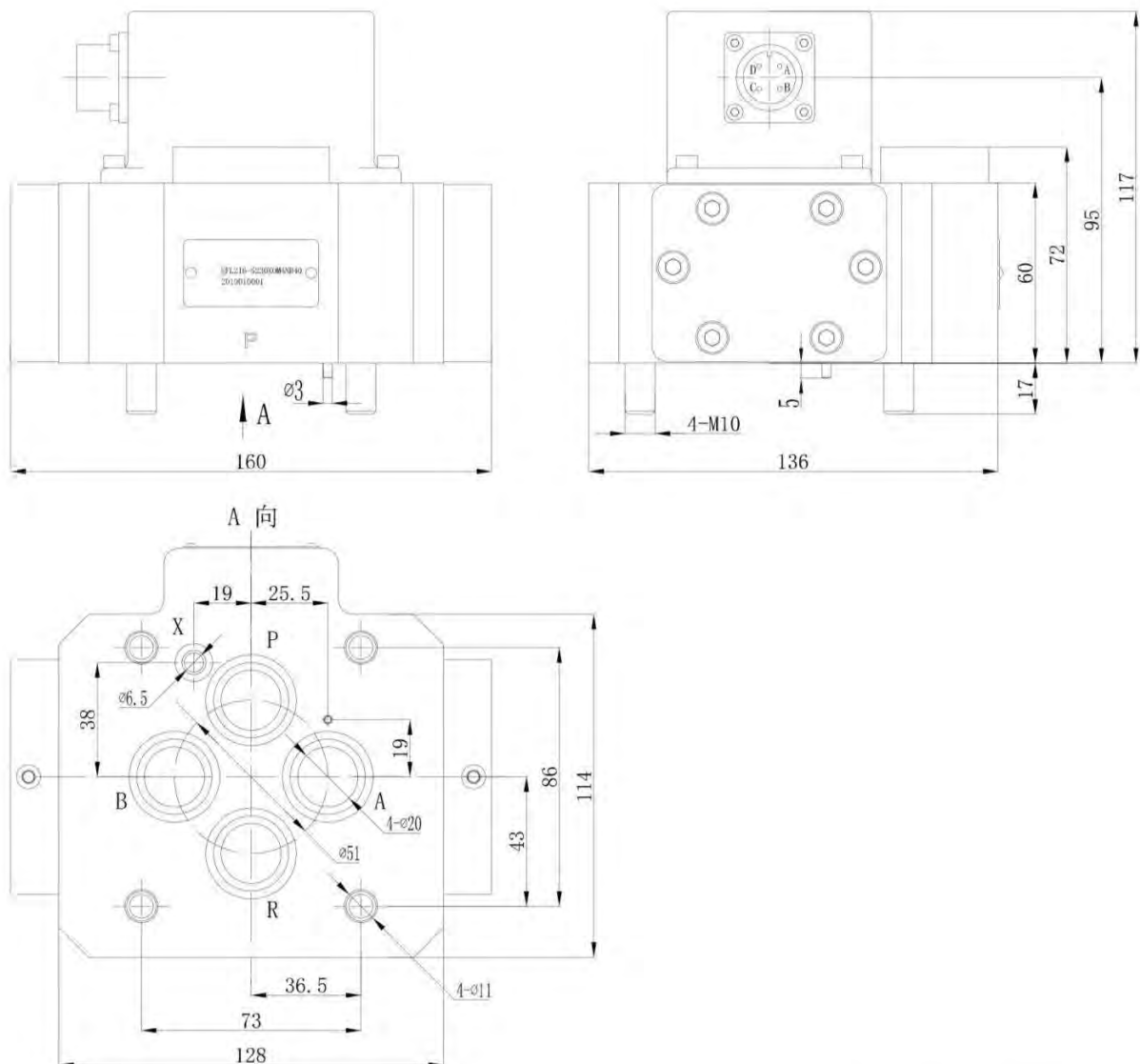
Valve protection type according to standard EN 60 529	IP65
Signal type	Analog quantity
Rated current per coil	m A 40
Each coil resistance	Ω 80 (according to user needs)
Socket	Standard electrical receptacle, mates with MS3106F14S-2S or other equivalent plug
Servo Amplifier	External servo amplifier (Model: HTSA101, ordered separately)

□ Electrical Wiring

	Parallel connection	In series	Single Coil
Coil connection form			
Coil resistor (Ω)	40	160	80
Rated current (mA)	40	20	40
Coil inductance (H)	0.36	1.44	0.72
Input polarity when valve is at P→B, A→T	A and C (+), B and D (-)	A (+), D (-), B, C are shorted	A(+), B(-), or C(+), D(-)

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ Dimensions and Interface



- The installation surface of the valve complies with ISO10372 - 06 - 05 - 0 - 92, the roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	25×2.65	4
For X ports	9×1.8	1
Configuration plug (degree of protection IP65)	14S2S	1
Mounting screw	M10×60	4
Protective base	PP or 2A12	1

Ordering Information

SFL216 —

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Valve response type	
S	Standard Responses

Rated flow	
When Pn=3.5MPa per section Qn[L/min]	
230	230

Maximum Working Pressure and Body Material			
F	21	MPa	Aluminum shell
K	35	MPa	Steel shell

Valve Spool Type	
O	Four-way, zero opening, linear flow gain
A	Four-way, 1.5% ~ 3% positive overlap, linear gain
D	Four-way, 10% positive overlap, linear gain
X	Customized on demand

The position of the spool when there is no control electric signal	
M	Centre position
A	P→B, A→T
B	P→A, B→T

Signal current for fully open valve			
15	±15	mA	Parallel connection
40	±40	mA	Parallel connection
80	±80	mA	Parallel connection
Customized on demand			

Valve Socket	
A	The socket is facing the A port
B	The socket is facing the B port
P	The socket is facing the P port
T	The socket is facing the T port

Seal material	
N	Nitrile Rubber (NBR) Standard Type
V	Viton (FPM)
Customized on demand	

Pilot valve control oil	
4	Internal Control
5	External control

SFL218 Double nozzle baffle two-stage electro-hydraulic servo valve

Features

- Two-stage servo valve, flow control
- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- Large spool driving force
- High resolution, low hysteresis, excellent performance, high dynamic response
- Suitable for closed-loop control of position, force and velocity
- Can be used as a 3-way valve
- Optional fifth port for separate pilot control
- Disc oil filter for field replaceable pilot valve

Main Parameter
General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure ($\geq 2\text{MPa}$) when the system starts
Weight	k g	2.1

Technical Parameters

Work Pressure				
Oil mouth P, A, B	MPa	≤ 31.5		
Oil mouth T	MPa	≤ 21		
Rated flow (differential pressure $\Delta P = 7\text{MPa}$)	L/min	4;10	20	40;60
Zero bias	%	$\leq \pm 2$		
Hysteresis loop	%	≤ 4		
Resolution	%	≤ 1		
Non-linearity	%	≤ 7.5		
Asymmetry	%	≤ 7.5		
Endoleak	L/min	≤ 1.5	≤ 2	≤ 3
Pressure Gain	%Pn/1%In	≥ 30		
Oil supply pressure zero drift (80~110%Pn)	%	$\leq \pm 2$		

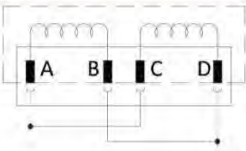
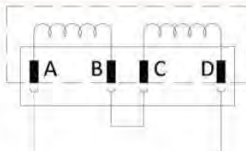
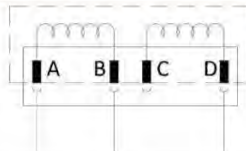


Oil return pressure zero drift	%	$\leq \pm 2$		
Temperature zero drift (every 40°C change in temperature) %		$\leq \pm 2$		
Amplitude bandwidth (3dB)	Hz	≥ 80	≥ 50	≥ 40
Phase bandwidth(-90°)	Hz	≥ 100	≥ 60	≥ 50
Valve body structure	Four-way, two-stage servo valve with spool and sleeve			
Pilot stage	Nozzle Flapper Valves			
Pilot oil supply method	Internal supply control oil, internal oil return			
Pilot Oil Filtration	With internal oil filter			
Installation form	ISO 10372-06-05-0-92			

Electrical Parameters

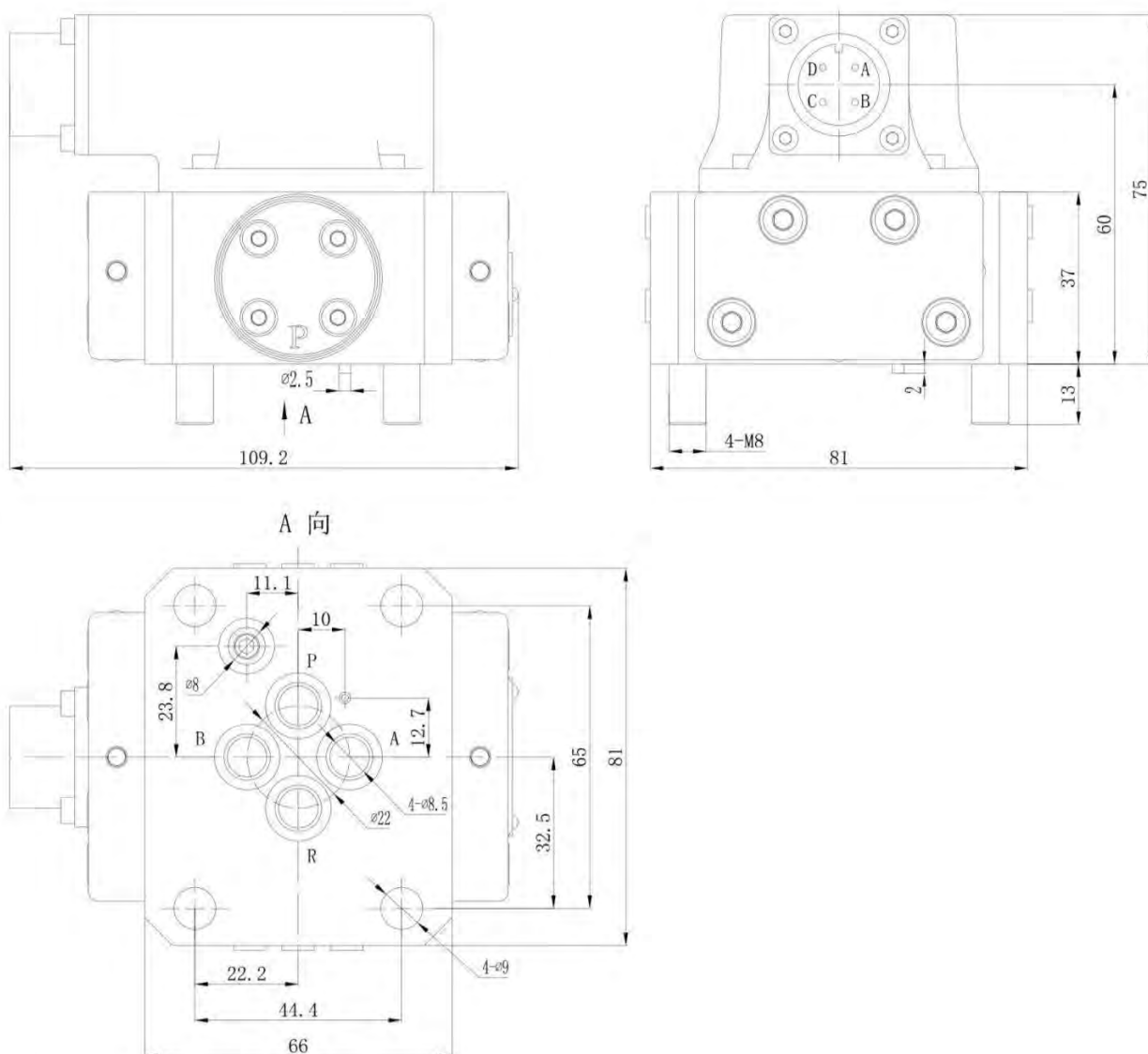
Valve protection type according to standard EN 60 529	IP65
Signal type	Analog quantity
Rated current per coil m A	40
Each coil resistance Ω	80 (according to user needs)
Socket	Standard electrical receptacle, mates with MS3106F14S-2S or other equivalent plug
Servo Amplifier	External servo amplifier (Model: HTSA101, ordered separately)

□ Electrical Wiring

	Parallel connection	In series	Single Coil
Coil connection form			
Coil resistor (Ω)	40	160	80
Rated current (mA)	40	20	40
Coil inductance (H)	0.36	1.44	0.72
Input polarity when valve is at P→B, A→T	A and C (+), B and D (-)	A (+), D (-), B, C are shorted	A(+), B(-), or C(+), D(-)

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ **Dimensions and Interface**



- The installation surface of the valve complies with ISO10372 - 06 - 05 - 0 - 92, the roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ **Spare Parts & Accessories**

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	10.6×1.8	4
For X ports	8.5×1.8	1
Configuration plug (degree of protection IP65)	14S2S	1
Mounting screw	M8×50	4
Protective base	PP or 2A12	1



□ **Ordering Information**

SFL218 —

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Valve response type	
S	Standard Responses
H	High frequency

Rated flow	
When Pn=3.5MPa per section Qn[L/min]	
04	4
10	10
20	20
40	40
60	60

Maximum Working Pressure and Body Material			
F	21	MPa	Aluminum shell
K	35	MPa	Steel shell

Valve Spool Type	
O	Four-way, zero opening, linear flow gain
A	Four-way, 1.5% ~ 3% positive overlap, linear gain
D	Four-way, 10% positive overlap, linear gain
X	Customized on demand

Signal current for fully open valve			
15	±15	mA	Parallel connection
40	±40	mA	Parallel connection
80	±80	mA	Parallel connection
Customized on demand			

Valve Socket	
A	The socket is facing the A port
B	The socket is facing the B port
P	The socket is facing the P port
T	The socket is facing the T port

Seal material	
N	Nitrile Rubber (NBR) Standard Type
V	Viton (FPM)
Customized on demand	

Pilot valve control oil	
4	Internal Control
5	External control

The position of the spool when there is no control electric signal	
M	Centre position
A	P→B, A→T
B	P→A, B→T

SFL218A Double nozzle baffle two-stage electro-hydraulic servo valve



□ Features

- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- Large spool driving force
- High resolution, low hysteresis
- With external zero adjustment mechanism
- Optional fifth port for separate pilot control
- Disc oil filter for field replaceable pilot valve

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio β ₅ ≥75
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure (≥2MPa) when the system starts
Weight	k g	2.8

Technical Parameters

Work Pressure			
Oil mouth P, A, B	MPa	≤31.5	
Oil mouth T	MPa	≤21	
Rated flow (differential pressure ΔP = 7 MPa)	L/min	5;10	20 40;60
Zero bias	%	≤±2	
Hysteresis loop	%	≤4	
Resolution	%	≤1	
Non-linearity	%	≤10	
Asymmetry	%	≤10	
Endoleak	L/min	≤1.5	≤2 ≤3
Pressure Gain	%Pn/1%In	≥30	
Oil supply pressure zero drift (80~110%Pn)	%	≤±4	



Oil return pressure zero drift	%	$\leq \pm 4$		
Temperature zero drift (every 40°C change in temperature)	%	$\leq \pm 4$		
Amplitude bandwidth (3dB)	Hz	≥ 60	≥ 50	≥ 40
Phase bandwidth(-90°)	Hz	≥ 70	≥ 60	≥ 50
Valve body structure	Four-way, two-stage servo valve with spool and sleeve			
Pilot stage	Nozzle Flapper Valves			
Pilot oil supply method	Internal supply control oil, internal oil return			
Pilot Oil Filtration	With internal oil filter			
Installation form	ISO 10372-06-05-0-92			

Electrical Parameters

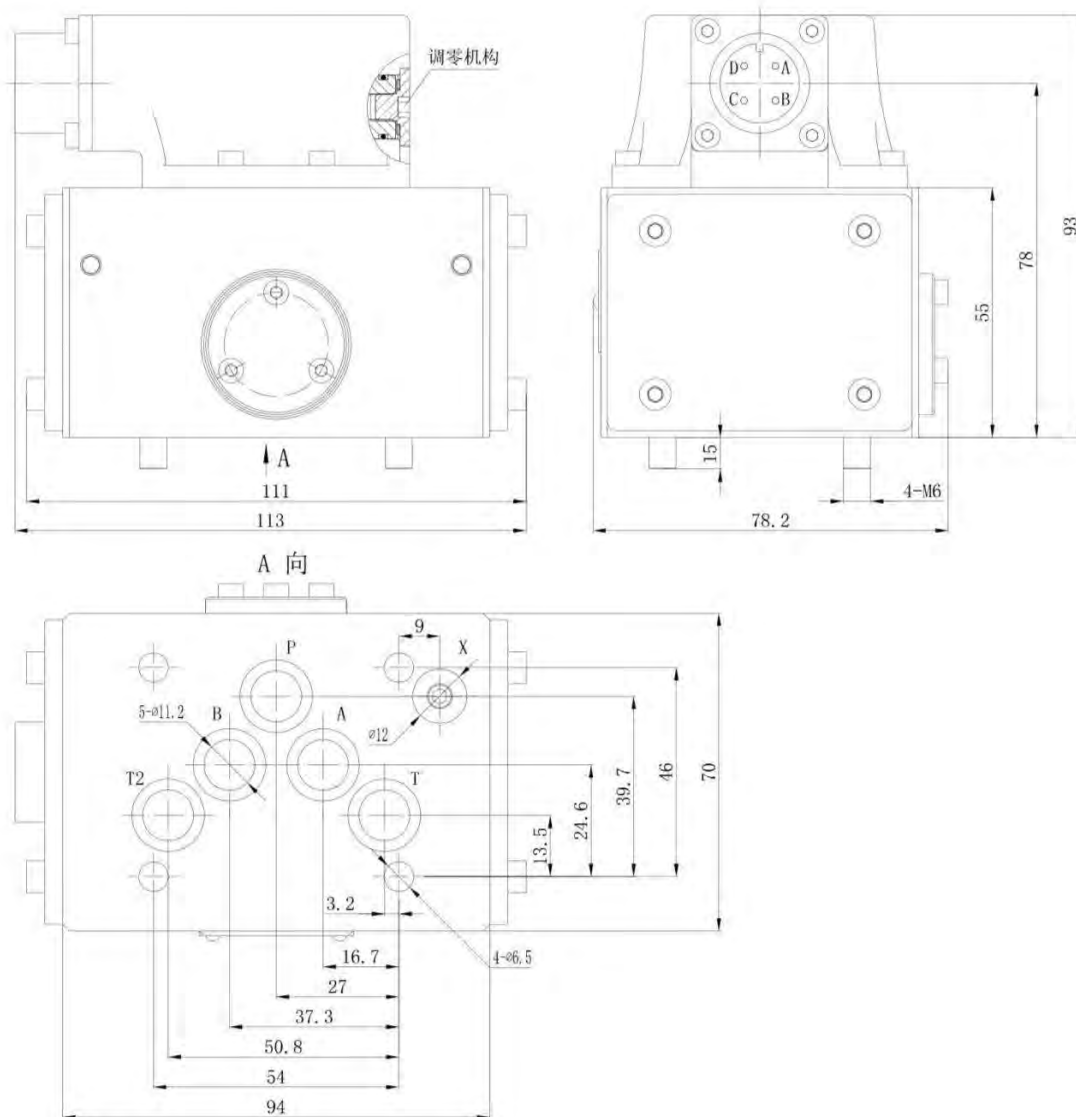
Valve protection type according to standard EN 60 529	IP65
Signal type	Analog quantity
Rated current per coil	m A 40
Each coil resistance	Ω 80 (according to user needs)
Socket	Standard electrical receptacle, mates with MS3106F14S-2S or other equivalent plug
Servo Amplifier	External servo amplifier (Model: HTSA101, ordered separately)

□ Electrical Wiring

	Parallel connection	In series	Single Coil
Coil connection form			
Coil resistor (Ω)	40	160	80
Rated current (mA)	40	20	40
Coil inductance (H)	0.36	1.44	0.72
Input polarity when valve is at P→B, A→T	A and C (+), B and D (-)	A (+), D (-), B, C are shorted	A(+), B(-), or C(+), D(-)

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ Dimensions and Interface



- The installation surface of the valve complies with ISO10372 - 06 - 05 - 0 - 92, the roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	12.5×1.8	5
For X ports	8.5×1.8	1
Configuration plug (degree of protection IP65)	14S2S	1
Mounting screw	M6×60	4
Protective base	PP or 2A12	1



□ Ordering Information

SFL218A—

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Valve response type	
S	Standard Responses

Rated flow	
When Pn=3.5MPa per section Qn[L/min]	
05	5
10	10
20	20
40	40
60	60

Maximum Working Pressure and Body Material			
F	21	MPa	Aluminum shell
K	35	MPa	Steel shell

Valve Spool Type	
O	Four-way, zero opening, linear flow gain
A	Four-way, 1.5% ~ 3% positive overlap, linear gain
D	Four-way, 10% positive overlap, linear gain
X	Customized on demand

The position of the spool when there is no control electric signal	
M	Centre position
A	P→B, A→T
B	P→A, B→T

Signal current for fully open valve			
10	±10	mA	Parallel connection
30	±30	mA	Parallel connection
40	±40	mA	Parallel connection
50	±50	mA	Parallel connection
100	±100	mA	Parallel connection
Customized on demand			

Valve Socket	
A	The socket is facing the A port
B	The socket is facing the B port
P	The socket is facing the P port
T	The socket is facing the T port

Seal material	
N	Nitrile Rubber (NBR) Standard Type
V	Viton (FPM)
Customized on demand	

Pilot valve control oil	
4	Internal Control
5	External control

SFL218B Double nozzle baffle two-stage electro-hydraulic servo valve



□ Features

- Two-stage servo valve, flow control
- Adopt dry force motor and two-stage hydraulic amplifier structure
- Double nozzle baffle valve with no friction pair in front stage
- The output stage is a four-way spool valve with a large driving force
- High Resolution, Low Hysteresis
- With external mechanical zero adjustment mechanism
- Suitable for position, speed, force (or pressure) servo control

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +60
Operating ambient temperature	°C	-40 to +120
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio β ₅ ≥75
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure (≥2MPa) when the system starts
Weight	k g	2.2

Technical Parameters

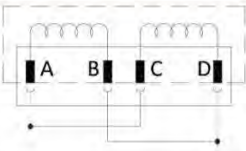
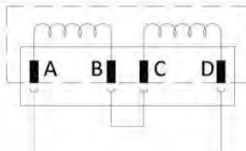
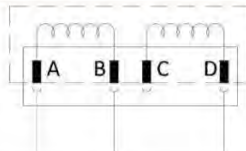
Work Pressure				
Oil mouth P, A, B	MPa	≤21		
Oil mouth T	MPa	≤14		
Rated flow (differential pressure ΔP = 7 MPa)	L/min	5;10	20	40;60
Zero bias	%	≤±2		
Hysteresis loop	%	≤5		
Resolution	%	≤1		
Non-linearity	%	≤10		
Asymmetry	%	≤10		
Endleak	L/min	≤2	≤3	≤4
Pressure Gain	%Pn/1%In	≥30		
Oil supply pressure zero drift (80~110%Pn)	%	≤±5		

Amplitude bandwidth (3dB)	Hz	≥40
Phase bandwidth(-90°)	Hz	≥50
Valve body structure	Four-way, two-stage servo valve with spool and sleeve	
Pilot stage	Nozzle Flapper Valves	
Pilot oil supply method	Internal supply control oil, internal oil return	
Pilot Oil Filtration	With internal oil filter	
Installation form	ISO 10372-06-05-0-92	

Electrical Parameters

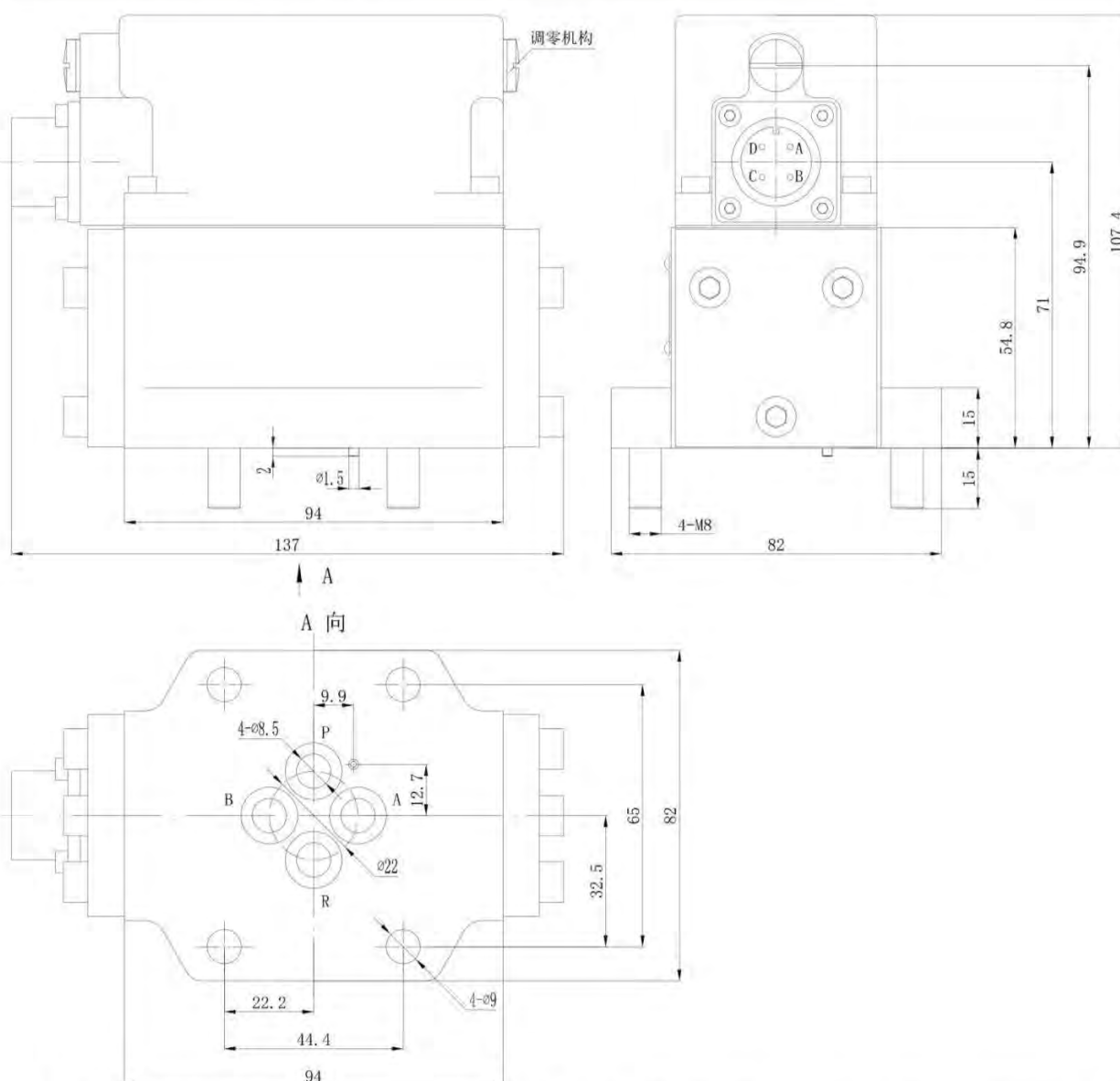
Valve protection type according to standard EN 60 529	IP65	
Signal type	Analog quantity	
Rated current per coil	m A	40
Each coil resistance	Ω	80 (according to user needs)
Socket	Standard electrical receptacle, mates with MS3106F14S-2S or other equivalent plug	
Servo Amplifier	External servo amplifier (Model: HTSA101, ordered separately)	

□ Electrical Wiring

	Parallel connection	In series	Single Coil
Coil connection form			
Coil resistor (Ω)	40	160	80
Rated current (mA)	40	20	40
Coil inductance (H)	0.36	1.44	0.72
Input polarity when valve is at P→B, A→T	A and C (+), B and D (-)	A (+), D (-), B, C are shorted	A(+), B(-), or C(+), D(-)

Note: The pilot stage must first establish oil pressure before inputting electrical signals.

□ Dimensions and Interface



- The installation surface of the valve complies with ISO10372 - 06 - 05 - 0 - 92, the roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or Accessories	Size or Specification	Quantity
NBR O-rings		
For P, T, A and B ports	10.6×1.8	4
Configuration plug (degree of protection IP65)	14S2S	1
Mounting screw	M8×30	4
Protective base	PP or 2A12	1



□ Ordering Information

SFL218B—



Valve response type

S Standard Responses

Rated flow

When $P_n=3.5\text{MPa}$ per section $Q_n[\text{L/min}]$

05

5

10

10

20

20

40

40

60

60

Maximum Working Pressure and Body Material

F 21 MPa Aluminum shell

Valve Spool Type

O Four-way, zero opening, linear flow gain

A Four-way, 1.5% ~ 3% positive overlap, linear gain

D Four-way, 10% positive overlap, linear gain

X Customized on demand

The position of the spool when there is no control electric signal

M Centre position

A $P \rightarrow B$, $A \rightarrow T$

B $P \rightarrow A$, $B \rightarrow T$

Signal current for fully open valve

15 ± 15 mA Parallel connection

30 ± 30 mA Parallel connection

40 ± 40 mA Parallel connection

50 ± 50 mA Parallel connection

100 ± 100 mA Parallel connection

Customized on demand

Valve Socket

A The socket is facing the A port

B The socket is facing the B port

P The socket is facing the P port

T The socket is facing the T port

Seal material

N Nitrile Rubber (NBR) Standard Type

V Viton (FPM)

Customized on demand

Pilot valve control oil

4 Internal Control

SFD234 Electric Feedback Jet Tube Servo Valve



□ Features

- Suitable for electro-hydraulic position, speed, pressure and force control systems
- The dynamic response of the jet tube is high, and it is suitable for systems that require high resolution and high dynamics at the same time
- Reliable performance. The pilot stage of the jet tube has high pressure efficiency, which can provide a large driving force for the power stage spool valve and ensure the position repeatability of the valve core
- The pilot stage filter has a long service life and strong anti-pollution ability
- Optional use of X and Y ports for externally controlled leakage of the pilot stage
- Can be used in die-casting machines, injection molding machines and other heavy industries

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +80
Operating ambient temperature	°C	-40 to +60
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure ($\geq 2\text{MPa}$) when the system starts
Weight	k g	6.1

Technical Parameters

Work Pressure			
Oil mouth P, A, B (X port external control)	MPa	≤ 35	
Oil mouth T (Y mouth inner row)	MPa	≤ 21	
Oil mouth (Y port outside row)	MPa	≤ 35	
Rated flow (differential pressure $\Delta P = 7\text{MPa}$)	L/min	20;30	40 ; 60 ; 80 ; 90 120 ; 160 ; 200
Zero bias	%	$\leq \pm 1$	
Hysteresis loop	%	≤ 0.4	
Resolution	%	≤ 0.1	
Non-linearity	%	≤ 10	
Asymmetry	%	≤ 10	
Endoleak	L/min	≤ 4	≤ 4.7 ≤ 5.4



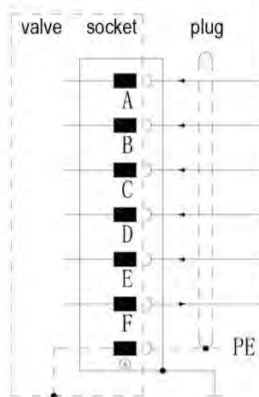
Amplitude bandwidth (3dB)	Hz	≥75
Phase bandwidth(-90°)	Hz	≥75
Valve body structure	Four-way, two-stage servo valve with spool and sleeve	
Pilot stage	Nozzle Flapper Valves	
Pilot oil supply method	Internal supply control oil, internal oil return	
Pilot Oil Filtration	With internal oil filter	
Installation form	ISO 10372-06-05-0-92	

Electrical Parameters

Valve protection class	Conforms to standards EN60 529, IP65	
Instruction signal	0~±10mA	0~±10V
Supply power	24VDC (18~32VDC), I _{max} =300mA	
Socket	6+PE socket	
Command signal and spool displacement	The stroke of the spool is proportional to (ID - IE), when ID=+10mA, the spool is at the fully open position of P→A, B→T	The stroke of the spool is proportional to (UD - UE), when (UD - UE)=+10V, the spool is at the fully open position of P→A, B→T
Main spool actual displacement output	Main spool displacement output IF - B=4~20mA, 12mA when the spool is in neutral position, 20mA corresponds to fully open valve port and P→A, B→T	Main spool displacement output UF-B=2~10V, 6V when the spool is in the middle position; or IF-B=4~20mA, 12mA when the spool is in the middle position
Command signal is 0	The spool is in the middle position	

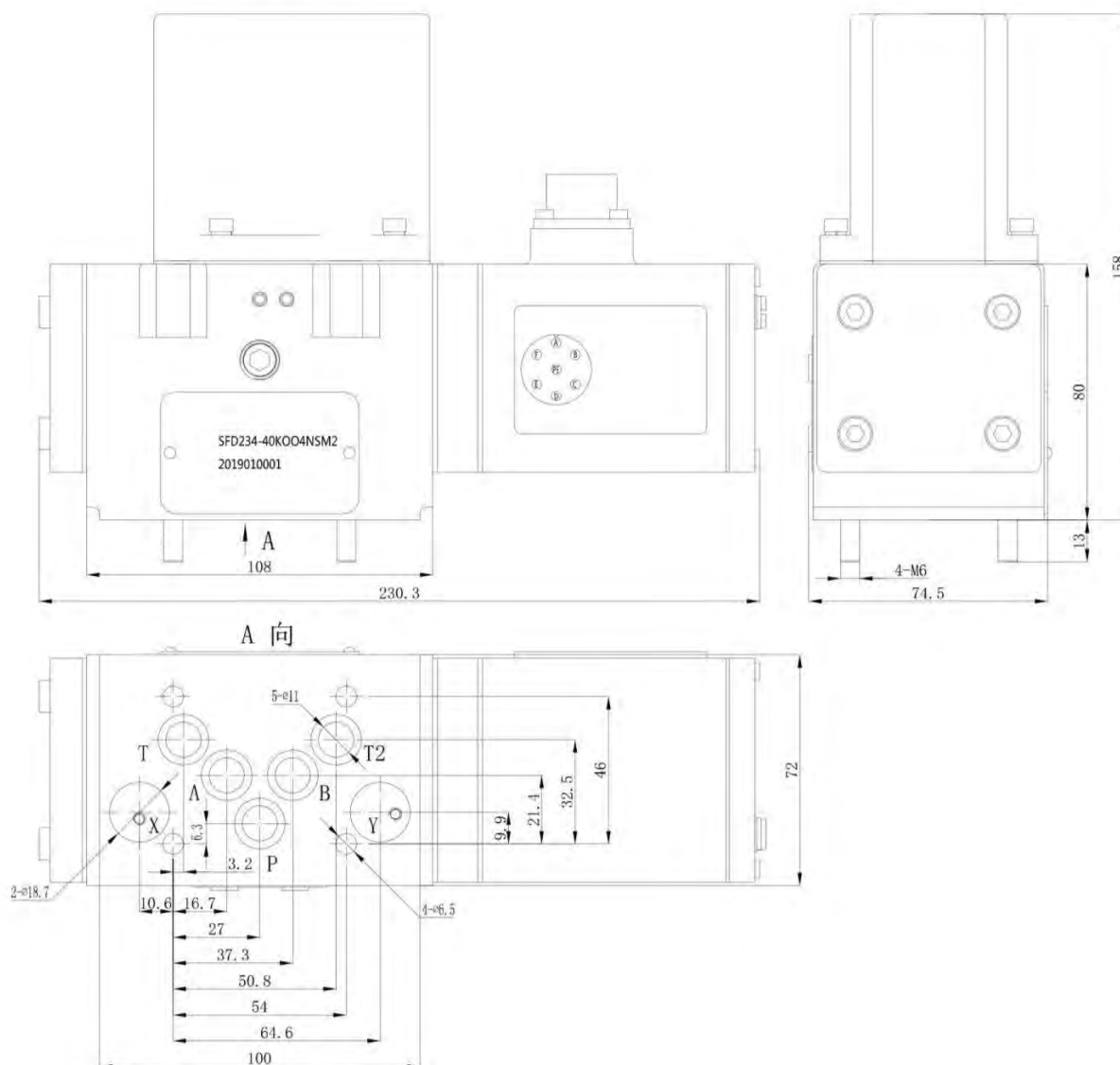
Note: All signal lines must use shielded cables.

□ Electrical Wiring



Function	Voltage command (0 - ±10VDC)	Current instruction (0 - ±10mA)
Power supply	24VDC (minimum 18VDC, maximum 32VDC), I _{max} =300mA	
Power/Signal Ground	(0V)	
Enable signal	V _{CE} > 8.5VDC	
Non-enable signal	V _{CE} < 6.5VDC	
Instruction signal input (differential)	U _{AB} =0~+10V R _e : 10kΩ	I _B =I _A : 0~±10mA (R _e =200Ω) I _E =I _F : 0~±10mA
Spool actual displacement output signal	I _{FE} =4~20mA, The main spool is in the middle position at 12mA, when the command signal is 0~±10VDC, U _{FE} =2~10V, and the spool is in the middle position at 6V	
Protective grounding		

□ Dimensions and Interface



- The installation surface of the valve complies with ISO4401-05-05-0-94, the roughness of the installation surface of the valve is not less than $\sqrt[1.6]{}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or accessories	Size or Specifications	Quantity
NBR O-rings		
For P, T, T2, A and B ports	12.5×1.8	5
For X, Y port	15.5×1.8	2
Configuration plug (degree of protection IP65)	6+PE plug	1
Mounting screws	M6×60	4
Protective base	PP or 2A12	1



Ordering Information

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<table><tr><td colspan="2">Rated flow</td></tr><tr><td colspan="2">When Pn=3.5MPa per section Qn[L/min]</td></tr><tr><td>20</td><td>20</td></tr><tr><td>30</td><td>30</td></tr><tr><td>40</td><td>40</td></tr><tr><td>60</td><td>60</td></tr><tr><td>80</td><td>80</td></tr><tr><td>90</td><td>90</td></tr><tr><td>01</td><td>120</td></tr><tr><td>02</td><td>160</td></tr><tr><td>03</td><td>200</td></tr></table>		Rated flow		When Pn=3.5MPa per section Qn[L/min]		20	20	30	30	40	40	60	60	80	80	90	90	01	120	02	160	03	200	<table><tr><td colspan="2">Maximum Working Pressure and Body Material</td></tr><tr><td>K</td><td>35 MPa</td></tr></table>		Maximum Working Pressure and Body Material		K	35 MPa	<table><tr><td colspan="2">Valve Spool Type</td></tr><tr><td>O</td><td>Four-way, zero opening, linear flow gain</td></tr><tr><td>D</td><td>Four-way, 10% positive overlap, linear gain</td></tr><tr><td>X</td><td>Customized on demand</td></tr></table>		Valve Spool Type		O	Four-way, zero opening, linear flow gain	D	Four-way, 10% positive overlap, linear gain	X	Customized on demand	<table><tr><td colspan="2">The position of the spool when there is no control electric signal</td></tr><tr><td>O</td><td>Not sure/Intermediate position</td></tr><tr><td>A</td><td>P→B, A→T</td></tr><tr><td>B</td><td>P→A, B→T</td></tr></table>		The position of the spool when there is no control electric signal		O	Not sure/Intermediate position	A	P→B, A→T	B	P→A, B→T	<table><tr><td colspan="2">Pilot stage control form and control pressure</td></tr><tr><td></td><td>Oil supply port X</td><td>Oil return port Y</td></tr><tr><td>4</td><td>internal control</td><td>inner row</td></tr><tr><td>5</td><td>External control</td><td>inner row</td></tr><tr><td>6</td><td>External control</td><td>Efflux</td></tr><tr><td>7</td><td>internal control</td><td>Efflux</td></tr></table>		Pilot stage control form and control pressure			Oil supply port X	Oil return port Y	4	internal control	inner row	5	External control	inner row	6	External control	Efflux	7	internal control	Efflux	<table><tr><td colspan="2">Function code</td></tr><tr><td>O</td><td>No enable signal input, C pin is empty</td></tr><tr><td>A</td><td>No enable signal, spool to neutral position</td></tr><tr><td>B</td><td>Without enabling signal, spool moves to A→T, or B→T</td></tr></table>		Function code		O	No enable signal input, C pin is empty	A	No enable signal, spool to neutral position	B	Without enabling signal, spool moves to A→T, or B→T	<table><tr><td colspan="2">Power supply</td></tr><tr><td>2</td><td>24VDC (18~32VDC)</td></tr><tr><td>0</td><td>Provide custom power supply ±15V</td></tr></table>		Power supply		2	24VDC (18~32VDC)	0	Provide custom power supply ±15V	<table><tr><td colspan="2">Signal corresponding to 100% rated displacement of spool</td></tr><tr><td></td><td>instruction signal</td><td>output signal</td></tr><tr><td>A</td><td>±10 V</td><td>±10 V</td></tr><tr><td>D</td><td>±10 V</td><td>2~10 V</td></tr><tr><td>M</td><td>±10 V</td><td>4~20 mA</td></tr><tr><td>X</td><td>±10 mA</td><td>4~20 mA</td></tr><tr><td>S</td><td>4~20 mA</td><td>4~20 mA</td></tr><tr><td>B</td><td>±10 mA</td><td>±10 mA</td></tr><tr><td>Y</td><td>Customized on demand</td><td></td></tr></table>		Signal corresponding to 100% rated displacement of spool			instruction signal	output signal	A	±10 V	±10 V	D	±10 V	2~10 V	M	±10 V	4~20 mA	X	±10 mA	4~20 mA	S	4~20 mA	4~20 mA	B	±10 mA	±10 mA	Y	Customized on demand		<table><tr><td colspan="2">Valve socket</td></tr><tr><td>S</td><td>6+PE socket</td></tr></table>		Valve socket		S	6+PE socket	<table><tr><td colspan="2">Seal material</td></tr><tr><td>N</td><td>Nitrile Rubber (NBR) Standard Type</td></tr><tr><td>V</td><td>Viton (FPM)</td></tr><tr><td></td><td>Customized on demand</td></tr></table>		Seal material		N	Nitrile Rubber (NBR) Standard Type	V	Viton (FPM)		Customized on demand
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B	±10 mA	±10 mA																																																																																																																																
Y	Customized on demand																																																																																																																																	
Valve socket																																																																																																																																		
S	6+PE socket																																																																																																																																	
Seal material																																																																																																																																		
N	Nitrile Rubber (NBR) Standard Type																																																																																																																																	
V	Viton (FPM)																																																																																																																																	
	Customized on demand																																																																																																																																	

SFZ141 Direct drive servo valve

Features

- Small leakage (no pilot stage flow), low power consumption (low power consumption of linear force motor), suitable for multi-valve control systems
- Low hysteresis and high resolution make the system have good control accuracy
- Large spool driving force
- It has a median fail-safe function.
- The position of the spool can be monitored, which is beneficial to the operation and maintenance of the system
- With electrical zero adjustment function

Main Parameter
General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +80
Operating ambient temperature	°C	-40 to +70
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Install at any position, and ensure that the pilot stage has sufficient pressure ($\geq 2\text{MPa}$) when the system starts
Weight	k g	2.75

Technical Parameters

Work Pressure				
Oil mouth P, A, B (X port external control) MPa	≤35			
Oil mouth T (When the Y port is not used) MPa	≤5			
Oil mouth T (When using the Y port) MPa	≤21			
Rated flow (differential pressure ΔP=7MPa) L/min	5	10	20	40
Zero bias %	≤±2			
Hysteresis loop %	≤0.2			
Resolution %	≤0.1			
Non-linearity %	≤10			
Asymmetry %	≤10			
Endoleak L/min	≤0.2	≤0.4	≤0.6	≤1.2

Amplitude bandwidth (-3dB)	Hz	≥30
Phase bandwidth(-90°)	Hz	≥40
Spool drive mode	Permanent Magnet Linear Force Motor Direct Drive	
Valve body structure	Single stage valve, 3-way, 4-way or 2×2-way, drain port Y optional	
Installation form	ISO 10372-06-05-0-92	

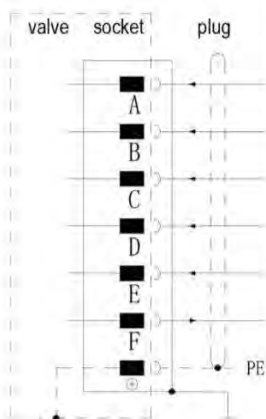
Electrical Parameters

Valve protection class	Conforms to standards EN60 529, IP65		
Instruction signal	0~±10V	0~±10mA	4~20mA
Supply power	24VDC (22~28VDC)		
Socket	6+PE		
Command signal and spool displacement	The stroke of the spool is proportional to (UD - UE) When UD - UE=+10V, the spool is in the fully open position of P→A, B→T, and the spool is in the neutral position when the command signal is 0	The stroke of the spool is proportional to (ID - IE), when ID=+10mA, the spool is in the fully open position of P→A, B→T, and the spool is in the neutral position when the command signal is 0	Spool stroke is proportional to (ID - 12mA) When ID=+20mA, the spool is at the full open position of P→A, B→T When ID=+4mA, the spool is at the full open position of P→B, A→T open position
Main spool actual displacement output	Main spool displacement output IF - B=4~20mA, when the spool is in the neutral position, IF - B=12mA, when the valve port is fully open and P→B, A→T, IF - B=+4mA, when the valve port Fully open and P→A, B→T IF - B=+20mA		

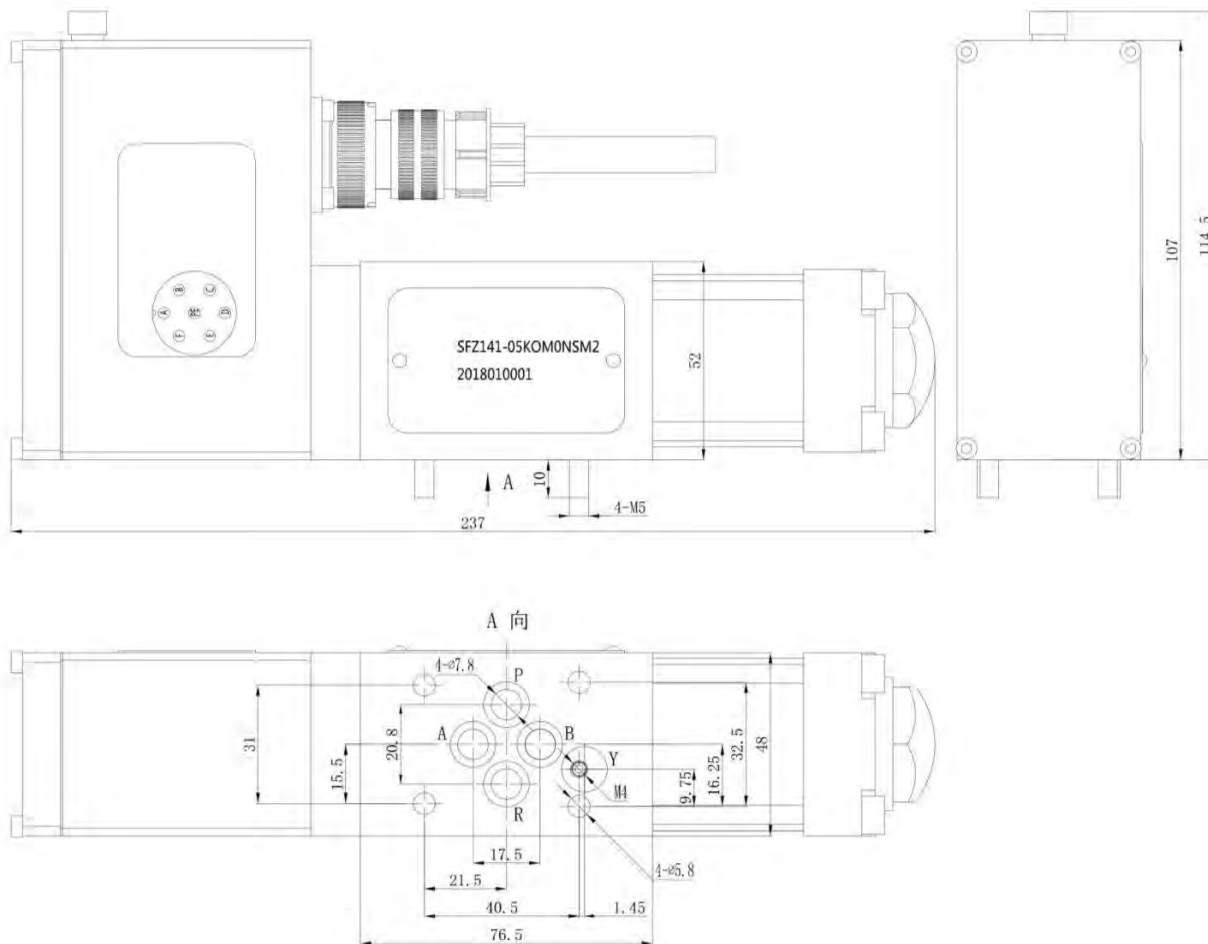
Note: All signal lines must use shielded cables.

Electrical Wiring

Function	Voltage command(0~±10VDC)	Current instruction(0~±10mA)	Current instruction(4~20mA)
Power supply	24VDC (22~28VDC)		
Power/signal ground	(0V)		
Instruction signal	$U_{IE}=0\sim\pm 10V$	$I_s\sim I_t: 0\sim\pm 10mA, R_e=200\Omega$	$I_{s,t}: 4\sim 20mA, R_e=200\Omega$
Anti-command signal	$R_e: 50k\Omega$	$I_t\sim I_s: 0\sim\pm 10mA, R_e=200\Omega$	
Spool actual displacement output signal	$I_{F,B}=4\sim 20mA$ When the spool is in the neutral position, $I_{F,B}=12mA$. The ground load impedance is 300-500Ω		
Protective grounding			



□ Dimensions and Interface



- The installation surface of the valve complies with ISO4401-03-03-0-94, the roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or accessories	Size or Specifications	Quantity
NBR O-rings		
For P, T, A and B ports	8.5×1.8	4
For Y port	8.5×1.8	1
Configuration plug (degree of protection IP65)	6+PE plug	1
Mounting screws	M5×45	4
Protective base	PP or 2A12	1



□ Ordering Information

SFZ141 —		•	•	•	•	•	•	•	•
Rated flow									
When Pn=3.5MPa per section Qn[L/min]									
05	5								
10	10								
20	20								
40	40								
Maximum Working Pressure and Body Material									
K	35 MPa								
Valve Spool Type									
O	Four-way, zero opening, linear flow gain								
A	Four-way, 1.5% ~ 3% positive overlap, linear gain								
D	Four-way, 10% positive overlap, linear gain								
Z	2×2-way, P→A, B→T; Y port back to oil tank								
X	Customized on demand								
The position of the spool when there is no control electric signal									
M	centre position								
A	P→B, A→T (The minimum opening is 10% of full opening)								
B	P→A, B→T (The minimum opening is 10% of full opening)								
	Customized on demand								
Power supply									
2	24VDC (18~32VDC)								
Electrical signal when the valve is fully open									
	instruction signal	Spool displacement signal output							
M	0~±10 V	4~20 mA							
P	0~±10 mA	4~20 mA							
S	4~20 mA	4~20 mA							
Y	Customized on demand								
Valve socket									
S	6+PE socket								
Seal material									
N	Nitrile Rubber (NBR) Standard Type								
V	Viton (FPM)								
	Customized on demand								
Y port									
0	blocked by a plug								
1	open, and built-in oil filter								

SFZ142 Direct drive servo valve



□ Features

- Small leakage (no pilot stage flow), low power consumption (low power consumption of linear force motor), suitable for multi-valve control systems
- Low hysteresis and high resolution make the system have good control accuracy
- Large spool driving force
- It has a median fail-safe function.
- The position of the spool can be monitored, which is beneficial to the operation and maintenance of the system
- With electrical zero adjustment function

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +80
Operating ambient temperature	°C	-30 to +70
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		Anywhere installation
Weight	k g	6.3

Technical Parameters

Work Pressure		
Oil mouth P, A, B (X port external control)	MPa	≤ 35
Oil mouth T (When the Y port is not used)	MPa	≤ 5
Oil mouth T (When using the Y port)	MPa	≤ 21
Rated flow (differential pressure $\Delta P = 7 \text{ MPa}$)	L/min	60 100
Zero bias	%	≤ ±2
Hysteresis loop	%	≤ 0.2
Resolution	%	≤ 0.1
Non-linearity	%	≤ 10
Asymmetry	%	≤ 10
Endleak	L/min	≤ 1.2 ≤ 2

Amplitude bandwidth (-3dB)	Hz	≥30
Phase bandwidth(-90°)	Hz	≥40
Spool drive mode	Permanent Magnet Linear Force Motor Direct Drive	
Valve body structure	Single stage valve, 3-way, 4-way or 2×2-way, drain port Y optional	
Installation form	ISO4401 - 05 - 05 - 0 - 94	

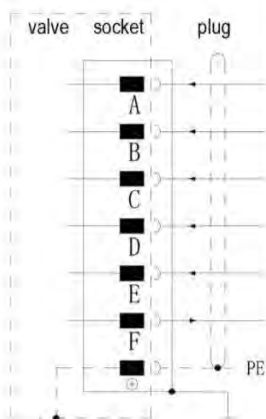
Electrical Parameters

Valve protection class	Conforms to standards EN60 529, IP65		
Instruction signal	0~±10V	0~±10mA	4~20mA
Supply power	24VDC (22~28VDC)		
Socket	6+PE		
Command signal and spool displacement	The stroke of the spool is proportional to (UD - UE) When UD - UE=+10V, the spool is in the fully open position of P→A, B→T, and the spool is in the neutral position when the command signal is 0	The stroke of the spool is proportional to (ID - IE), when ID=+10mA, the spool is in the fully open position of P→A, B→T, and the spool is in the neutral position when the command signal is 0	Spool stroke is proportional to (ID - 12mA) When ID=+20mA, the spool is at the full open position of P→A, B→T When ID=4mA, the spool is at the full open position of P→B, A→T open position
Main spool actual displacement output	Main spool displacement output IF - B=4~20mA, when the spool is in the neutral position, IF - B=12mA, when the valve port is fully open and P→B, A→T, IF - B=+4mA, when the valve port Fully open and P→A, B→T IF - B=+20mA		

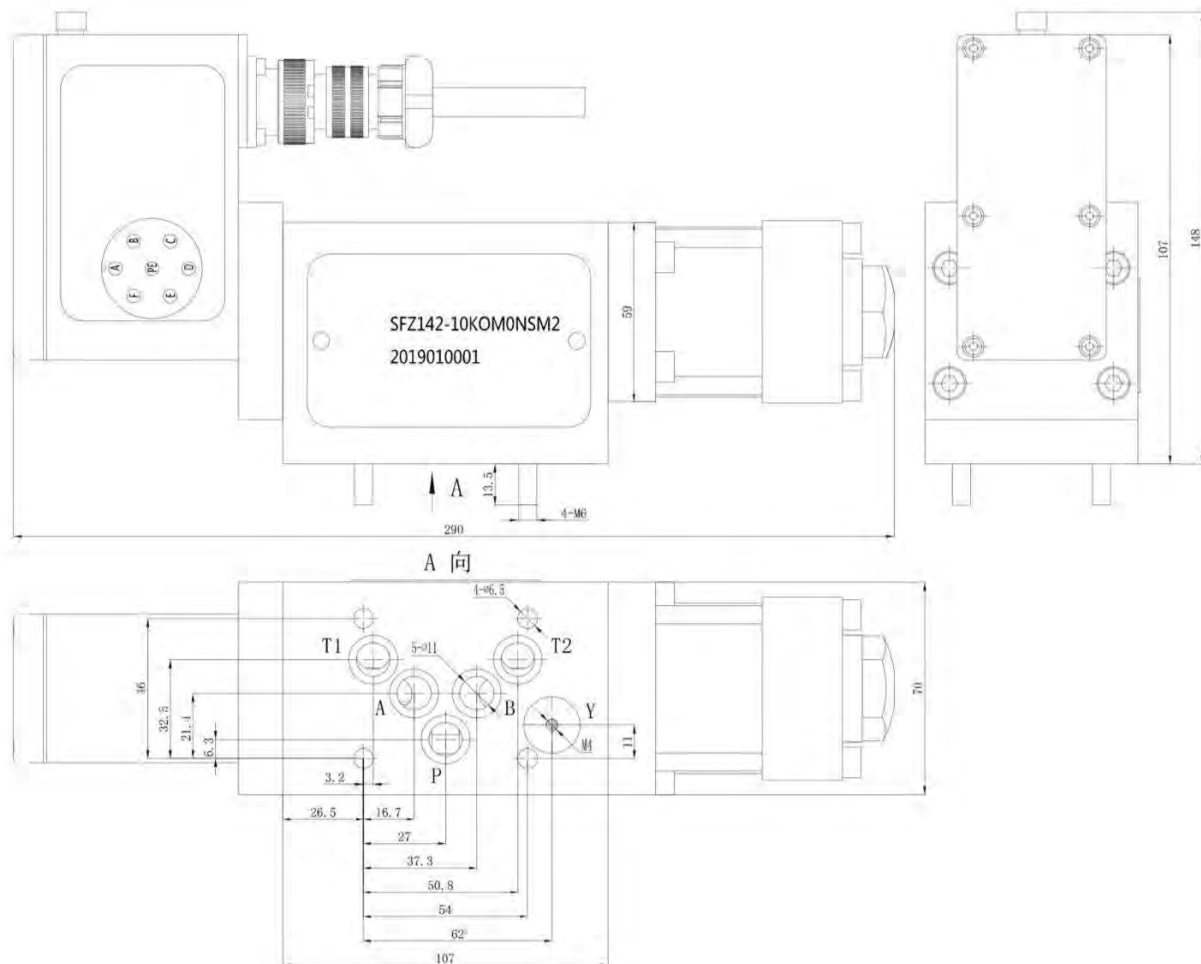
Note: All signal lines must use shielded cables.

Electrical Wiring

Function	Voltage command(0~±10VDC)	Current instruction(0~±10mA)	Current instruction(4~20mA)
Power supply	24VDC (22~28VDC)		
Power/signal ground	(0V)		
Instruction signal	$U_{IE}=0\sim\pm 10V$	$I_s\sim I_t: 0\sim\pm 10mA, R_e=200\Omega$	$I_{s,t}: 4\sim 20mA, R_e=200\Omega$
Anti-command signal	$R_e: 50k\Omega$	$I_t\sim I_s: 0\sim\pm 10mA, R_e=200\Omega$	
Spool actual displacement output signal	$I_{F,B}=4\sim 20mA$ When the spool is in the neutral position, $I_{F,B}=12mA$. The ground load impedance is 300-500Ω		
Protective grounding			



□ Dimensions and Interface



- The installation surface of the valve complies with ISO4401-05-05-0-94, the roughness of the installation surface of the valve is not less than $\sqrt[1.6]{}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or accessories	Size or Specifications	Quantity
NBR O-rings		
For P, T, A and B ports	12.5×1.8	5
For Y port	12.5×1.8	1
Configuration plug (degree of protection IP65)	6+PE plug	1
Mounting screws	M6×60	4
Protective base	PP or 2A12	1



□ Ordering Information

SFZ142 —		•	•	•	•	•	•	•	•	•
Rated flow When P _n =3.5MPa per section Q _n [L/min]										Power supply
60	60									2 24VDC (18~32VDC)
10	100									
Maximum Working Pressure and Body Material										Electrical signal when the valve is fully open
K	35 MPa									instruction signal Spool displacement signal output
										M 0~±10 V 4~20 mA
										P 0~±10 mA 4~20 mA
										S 4~20 mA 4~20 mA
										Y Customized on demand
Valve Spool Type										Valve socket
O	Four-way, zero opening, linear flow gain									S 6+PE socket
A	Four-way, 1.5% ~ 3% positive overlap, linear gain									
D	Four-way, 10% positive overlap, linear gain									
Z	2×2-way, P→A, B→T; Y port back to oil tank									
X	Customized on demand									Seal material
										N Nitrile Rubber (NBR) Standard Type
										V Viton (FPM)
										Customized on demand
The position of the spool when there is no control electric signal										Y port
M	centre position									0 blocked by a plug
A	P→B, A→T (The minimum opening is 10% of full opening)									I open, and built-in oil filter
B	P→A, B→T (The minimum opening is 10% of full opening)									
	Customized on demand									



SFL316 Electric feedback three-stage servo valve



□ Features

- Spool position closed-loop control feedback through differential linear displacement transducer (LVDT)
- Integrated amplifier with polarity protection
- High resolution, low hysteresis, good zero stability
- Parameters are pre-set at the factory

□ Main Parameter

General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +80
Operating ambient temperature	°C	-30 to +70
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio $\beta_5 \geq 75$
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		ISO compliant, but X and Y ports are not ISO compliant
Weight	k g	6.3

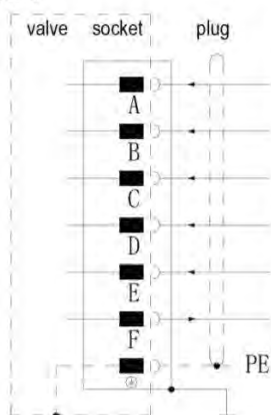
Technical Parameters

Work Pressure				
Ports P, A, B (inside X port)	MPa	≤ 31.5		
Ports P, A, B (X port drains)	MPa	≤ 35		
Port T (Y-port inner row)	MPa	≤ 21		
Port T (Y port drains)	MPa	≤ 35		
Rated flow (differential pressure $\Delta P = 7 \text{ MPa}$)	L/min	100	160	250
Zero bias	%	≤ 2		
Hysteresis loop	%	≤ 0.5		
Resolution	%	≤ 0.2		
Non-linearity	%	≤ 10		
Asymmetry	%	≤ 10		
Endleak	L/min	≤ 6	≤ 8	≤ 10
Amplitude bandwidth (- 3dB)	Hz	≥ 100		
Phase bandwidth (- 90°)	Hz	≥ 100		
Body structure		Three-Stage Servo Valve with Spool and Sleeve		
Pilot stage		Secondary nozzle flapper servo valve		
Pilot stage control oil form		Optional internal or external control		

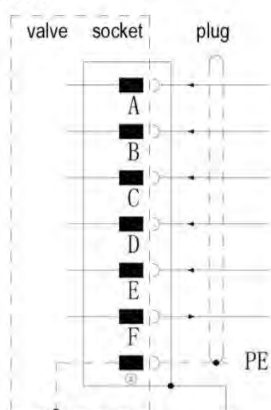
Electrical Parameters

Valve protection class	Conforms to standards EN60 529, IP65
Instruction signal	$0 \sim \pm 10\text{mA}$; or $0 \sim \pm 10\text{V}$; or $4 \sim 20\text{mA}$
Supply power	24VDC ($22 \sim 28\text{VDC}$), $I_{\text{max}}=300\text{mA}$, or $\pm 15\text{VDC}$, $I_{\text{max}}=250\text{mA}$
Socket	6+PE
Command signal and spool displacement	The stroke of the spool is proportional to $(U_D - U_E)$. When $U_D - U_E = +10\text{V}$, the spool is at the fully open position of $P \rightarrow A$ and $B \rightarrow T$. When the command signal is 0V , the spool is in the neutral position; the stroke of the spool is proportional to $A_t (I_D - I_E)$, when $I_D = +10\text{mA}$, the spool is in the fully open position of $P \rightarrow A$, $B \rightarrow T$, and the spool is in the neutral position when the command signal is 0mA
Main spool actual displacement output	$I_F - C = 4 \sim 20\text{mA}$, when the spool is in the neutral position, $I_F - C = 12\text{mA}$, when the valve port is fully open and $P \rightarrow B$, $A \rightarrow T$, $I_F - C = 4\text{mA}$, when the valve port is fully open and $P \rightarrow A$, $I_F - C = 20\text{mA}$ when $B \rightarrow T$; or $U_F - C = 2 \sim 10\text{V}$, 6V when the spool is in the middle position; or $0 \sim \pm 10\text{mA}$

Note: All signal lines must use shielded cables.

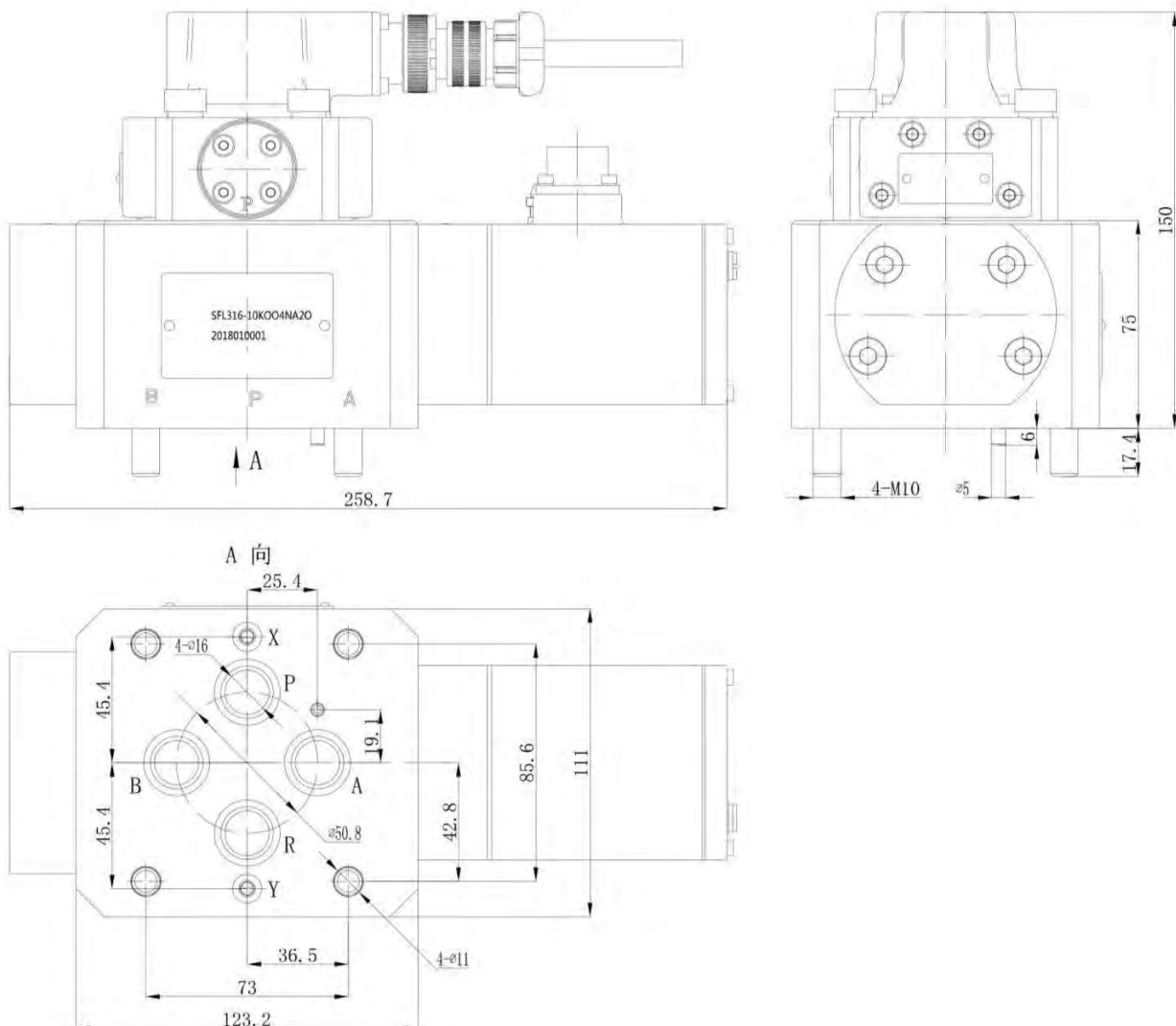
Electrical Wiring
24VDC


Function	Current instruction ($0 \sim \pm 10\text{mA}$)	Voltage command ($0 \sim \pm 10\text{VDC}$)
Power supply	24VDC ($18 \sim 32\text{VDC}$), $I_{\text{max}}=300\text{mA}$	
Power/signal ground	(0V)	
enable signal	$U_{\text{en}} > 8.5\text{VDC}$	24VDC , $I_e = 2.0\text{mA}$
Non-enable signal	$U_{\text{ns}} < 6.5\text{VDC}$	
Instruction signal input	$I_D = -I_S$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	$U_{DS} = 0 \sim +10\text{V}$
(differential)	$I_S = -I_D$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	$R_e = 10\text{k}\Omega$
Spool actual displacement output signal	$I_{FS} = 4 \sim 20\text{mA}$, At 12mA , the main spool is in the middle position, and the load impedance is $100\text{--}500\Omega$	
Protective grounding		

 $\pm 15\text{VDC}$


Function	Current instruction ($0 \sim \pm 10\text{mA}$)	Voltage command ($0 \sim \pm 10\text{VDC}$)
Power supply	$+15\text{VDC} \pm 3$	
Power supply	$-15\text{VDC} \pm 3$	
Power/signal ground	(0V)	
enable signal	$0 \sim \pm 10\text{mA}$	$0 \sim \pm 10\text{V}$
Non-enable signal	Load Resistance $1\text{k}\Omega$	input resistance $10\text{k}\Omega$
Instruction signal input	$I_S = -I_D$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	$U_{DS} = 0 \sim \pm 10\text{V}$, $R_e = 10\text{k}\Omega$
(differential)	$I_D = -I_S$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	
Spool actual displacement output signal	$0 \sim \pm 10\text{mA}$, Load resistance max 500Ω	$0 \sim \pm 10\text{VDC}$, input resistance $50\text{k}\Omega$
Protective grounding		

□ Dimensions and Interface



- The installation surface of the valve complies with ISO10372-06-05-0-92, the roughness of the installation surface of the valve is not less than $\frac{1.6}{\sqrt{R}}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or accessories	Size or Specifications	Quantity
NBR O-rings		
For P, T, A and B ports	20×1.8	4
For X,Y port	6.9×1.8	2
Configuration plug (degree of protection IP65)	6+PE plug	1
Mounting screws	M10×60	4
Protective base	PP or 2A12	1



□ Ordering Information

SFL316 —

•	•	•	•	•	•	•	•	•	•
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Rated flow

When $P_n=3.5\text{MPa}$ per section $Q_n[\text{L/min}]$

10	100
16	160
25	250

Maximum Working Pressure and Body Material

K	35	MPa
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Valve Spool Type

0	Four-way, zero opening, linear flow gain
X	Customized on demand

The position of the spool when there is no control electric signal

	Location	Pilot pressure (MPa)
0	uncertain	≥ 1.5
A	$P \rightarrow B, A \rightarrow T$	≥ 1.5
B	$P \rightarrow A, B \rightarrow T$	≥ 1.5

Pilot stage control oil connection

	Oil supply port X	Oil return port Y
4	internal control	inner row
5	External control	inner row
6	External control	out row
7	internal control	out row

Function Code

0	24V No enable signal input
P	15V No enable signal input
A	24V When there is no enable signal, the spool moves to the neutral position
B	24V When there is no enable signal, the spool moves to $A \rightarrow T$ or $B \rightarrow T$

Power supply

0	$\pm 15\text{VDC} \pm 3\%$, pulsation $< 50\text{mVpp}$
2	24VDC (18~32VDC)

Signal corresponding to 100% rated displacement of the main spool

	input	output
A	$\pm 10\text{ V}$	$\pm 10\text{ V}$
X	$\pm 10\text{ mA}$	$\pm 10\text{ mA}$, $\pm 15\text{V}$, 4~20 mA, DC24V
B	$\pm 10\text{ mA}$	$\pm 10\text{ mA}$
S	4~20 mA	4~20 mA
M	$\pm 10\text{ V}$	4~20 mA

Valve socket

S	6+PE, socket
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Seal material

N	Nitrile Rubber (NBR) Standard Type
V	Viton (FPM)

SFL317 Electric feedback three-stage servo valve

□ Features

- Spool position closed-loop control feedback through differential linear displacement transducer (LVDT)
- Integrated amplifier with polarity protection
- High resolution, low hysteresis, good zero stability
- Parameters are pre-set at the factory

□ Main Parameter
General parameters

Operating medium		Mineral oil or other fluids according to DIN 51524
Viscosity range	mm ² /s	15 to 380 (30 to 45 recommended)
Oil temperature range	°C	-20 to +80 (recommended +40 to +50)
Storage temperature	°C	-20 to +80
Operating ambient temperature	°C	-30 to +70
Oil cleanliness		Maximum permissible degree of contamination of the oil, Class 6 per NAS 1638
Filtration accuracy		Recommended filter minimum filtration ratio β ₅ ≥75
Seal material		Nitrile rubber, fluorine rubber, or other sealing materials according to user needs
Installation Requirements		MOOG Compliant
Weight	k g	23.2

Technical Parameters

Work Pressure					
Ports P, A, B (inside X port)	MPa	≤ 31.5			
Ports P, A, B (X port drains)	MPa	≤ 35			
Port T (Y-port inner row)	MPa	≤ 21			
Port T (Y port drains)	MPa	≤ 35			
Rated flow (differential pressure ΔP = 7 MPa)	L/min	400	630	800	1000
Zero bias	%	≤ 2			
Hysteresis loop	%	≤ 0.5			
Resolution	%	≤ 0.2			
Non-linearity	%	≤ 10			
Asymmetry	%	≤ 10			
Endleak	L/min	≤ 10	≤ 14	≤ 14	≤ 14
Amplitude bandwidth (- 3dB)	Hz	≥ 100			
Phase bandwidth (- 90°)	Hz	≥ 100			
Body structure		Three-Stage Servo Valve with Spool and Sleeve			
Pilot stage		Secondary nozzle flapper servo valve			
Pilot stage control oil form		Optional internal or external control			



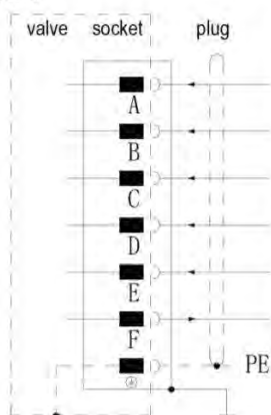
Electrical Parameters

Valve protection class	Conforms to standards EN60 529, IP65
Instruction signal	$0 \sim \pm 10\text{mA}$; or $0 \sim \pm 10\text{V}$; or $4 \sim 20\text{mA}$
Supply power	24VDC ($22 \sim 28\text{VDC}$), $I_{\text{max}}=300\text{mA}$, or $\pm 15\text{VDC}$, $I_{\text{max}}=250\text{mA}$
Socket	6+PE
Command signal and spool displacement	The stroke of the spool is proportional to $(U_D - U_E)$. When $U_D - U_E = +10\text{V}$, the spool is at the fully open position of $P \rightarrow A$ and $B \rightarrow T$. When the command signal is 0V , the spool is in the neutral position; the stroke of the spool is proportional to $A_t (I_D - I_E)$, when $I_D = +10\text{mA}$, the spool is in the fully open position of $P \rightarrow A$, $B \rightarrow T$, and the spool is in the neutral position when the command signal is 0mA
Main spool actual displacement output	$I_F - C = 4 \sim 20\text{mA}$, when the spool is in the neutral position, $I_F - C = 12\text{mA}$, when the valve port is fully open and $P \rightarrow B$, $A \rightarrow T$, $I_F - C = 4\text{mA}$, when the valve port is fully open and $P \rightarrow A$, $I_F - C = 20\text{mA}$ when $B \rightarrow T$; or $U_F - C = 2 \sim 10\text{V}$, 6V when the spool is in the middle position; or $0 \sim \pm 10\text{mA}$

Note: All signal lines must use shielded cables.

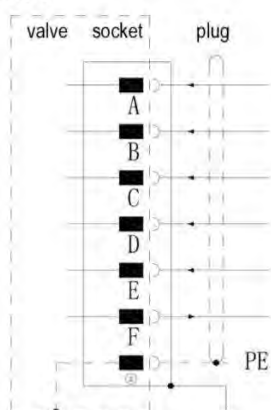
Electrical Wiring

24VDC



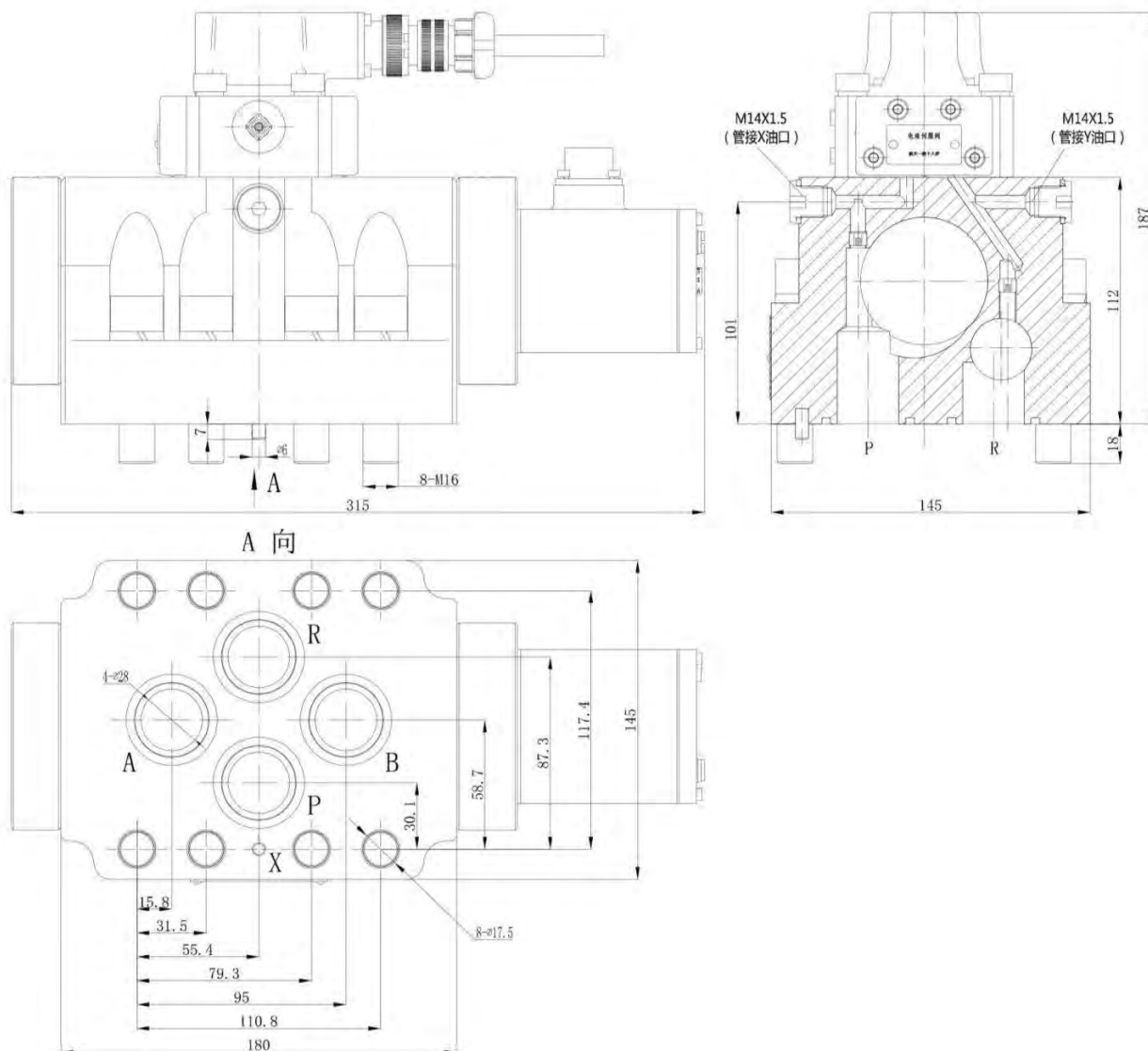
Function	Current instruction($0 \sim \pm 10\text{mA}$)	Voltage command($0 \sim \pm 10\text{VDC}$)
Power supply	24VDC ($18 \sim 32\text{VDC}$), $I_{\text{max}}=300\text{mA}$	
Power/signal ground	(0V)	
enable signal	$U_{\text{en}} > 8.5\text{VDC}$	24VDC , $I_e = 2.0\text{mA}$
Non-enable signal	$U_{\text{ns}} < 6.5\text{VDC}$	
Instruction signal input	$I_D = -I_S$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	$U_{DS} = 0 \sim +10\text{V}$
(differential)	$I_S = -I_D$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	$R_e = 10\text{k}\Omega$
Spool actual displacement output signal	$I_{FS} = 4 \sim 20\text{mA}$, At 12mA , the main spool is in the middle position, and the load impedance is $100\text{--}500\Omega$	
Protective grounding		

$\pm 15\text{VDC}$



Function	Current instruction($0 \sim \pm 10\text{mA}$)	Voltage command($0 \sim \pm 10\text{VDC}$)
Power supply	$+15\text{VDC} \pm 3$	
Power supply	$-15\text{VDC} \pm 3$	
Power/signal ground	(0V)	
enable signal	$0 \sim \pm 10\text{mA}$	$0 \sim \pm 10\text{V}$
Non-enable signal	Load Resistance $1\text{k}\Omega$	input resistance $10\text{k}\Omega$
Instruction signal input	$I_S = -I_D$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	$U_{DS} = 0 \sim \pm 10\text{V}$, $R_e = 10\text{k}\Omega$
(differential)	$I_D = -I_S$: $0 \sim \pm 10\text{mA}$ ($R_e = 200\Omega$)	
Spool actual displacement output signal	$0 \sim \pm 10\text{mA}$, Load resistance max 500Ω	$0 \sim \pm 10\text{VDC}$, input resistance $50\text{k}\Omega$
Protective grounding		

□ Dimensions and Interface



- The roughness of the installation surface of the valve is not less than $\sqrt{1.6}$, and the flatness is less than 0.01mm.
- In order to ensure that the servo valve can work normally, the system must be flushed before trial operation.

□ Spare Parts & Accessories

Parts or accessories	Size or Specifications	Quantity
NBR O-rings For P, T, A and B ports	35.5×3.55	4
Configuration plug (degree of protection IP65)	6+PE plug	1
Mounting screws	M16×75	8
Protective base	PP or 2A12	1



□ **Ordering Information**

SFL317 —



Rated flow

When $P_n=3.5\text{MPa}$ per section $Q_n[\text{L/min}]$

40 400

63 630

80 800

99 1000

Maximum Working Pressure and Body Material

K 35 MPa

Valve Spool Type

0 Four-way, zero opening, linear flow gain

X Customized on demand

The position of the spool when there is no control electric signal

Location Pilot pressure (MPa)

0 uncertain ≥ 1.5

A $P \rightarrow B, A \rightarrow T$ ≥ 1.5

B $P \rightarrow A, B \rightarrow T$ ≥ 1.5

Pilot stage control oil connection

Oil supply port X Oil return port Y

4 internal control inner row

5 External control inner row

6 External control out row

7 internal control out row

Function Code

0 24V No enable signal input

P 15V No enable signal input

A 24V When there is no enable signal, the spool moves to the neutral position

B 24V When there is no enable signal, the spool moves to A $\rightarrow$ T or B $\rightarrow$ T

Power supply

0 $\pm 15\text{VDC} \pm 3\%$, pulsation $< 50\text{mVpp}$

2 24VDC (18~32VDC)

Signal corresponding to 100% rated displacement of the main spool

	input	output
A	$\pm 10\text{ V}$	$\pm 10\text{ V}$
X	$\pm 10\text{ mA}$	$\pm 10\text{ mA}$, $\pm 15\text{V}$ 4~20 mA, DC24V
B	$\pm 10\text{ mA}$	$\pm 10\text{ mA}$
S	4~20 mA	4~20 mA
M	$\pm 10\text{ V}$	4~20 mA
E	$\pm 10\text{ V}$	$\pm 1.2\text{ V}$

Valve socket

S 6+PE, socket

Seal material

N Nitrile Rubber (NBR) Standard Type

V Viton (FPM)