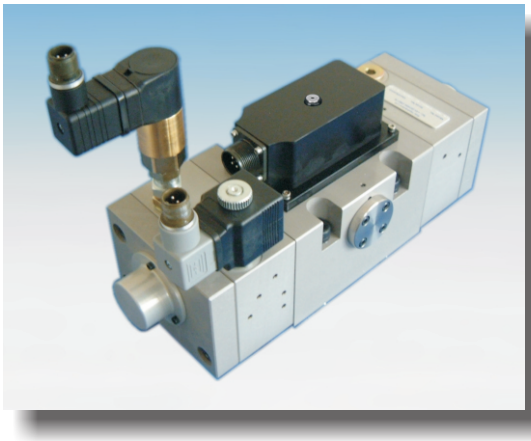
star
hydraulics ltd
SERVO TECHNOLOGY
AND RESEARCH

Model 990-3 Servovalve



- Nominal flow rates up to 300 l/min @ 70 bar
- ISO 10372-06 mounting pattern
- Sapphire Technology™
- Integral abort module with indicating switch
- Field replaceable filter
- Internal pilot supply

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Nominal flow ratings	up to 300 l/min at 70 bar Δp
Hysteresis	< 3% without dither
Threshold	< 0.5% without dither
Null bias	< 2%
Null shift	
with 40°C temp change	< 2%
with 70 bar supply pressure change	< 2%
with return pressure 0 to 35 bar	< 2%
Pressure gain	< 1% rated input signal for 60% of supply pressure
Seal materials available	FPM, NBR
Proof pressure	
at pressure port	150% max supply pressure
at return port	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	9.9 kg
Mounting position	Any, fixed or movable

Supply filtration		
minimum	$\beta_{10} \geq 75$ (10 micron abs)	
recommended	$\beta_5 = 200$ (5 micron abs)	
Fluid cleanliness level		
minimum	ISO 4406 - 16/13	NAS 1638 - class 7
recommended	ISO 4406 - 13/10	NAS 1638 - class 4
Supply pressure		
min. to effect spool movement	5 bar	
minimum recommended	25 bar	
maximum continuous	210 bar	
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:

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

Where:

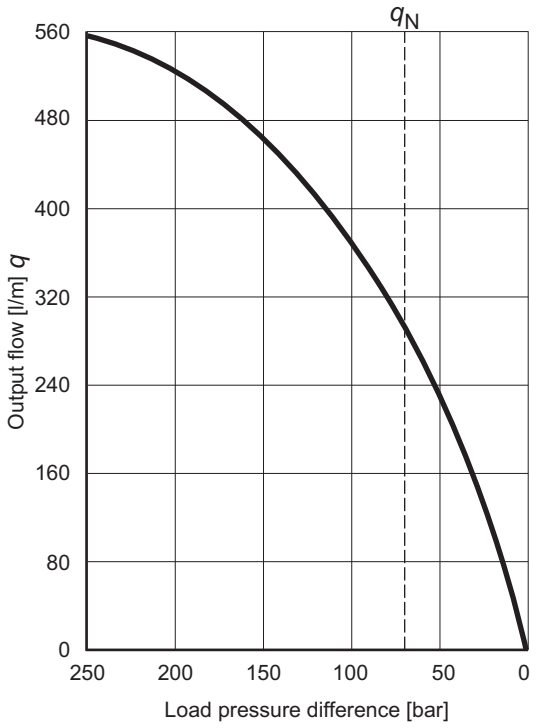
q = Output flow [l/min]

q_N = Rated flow [l/min]

Δp_N = Valve pressure drop [bar]

Δp_V = Rated valve pressure drop [bar]

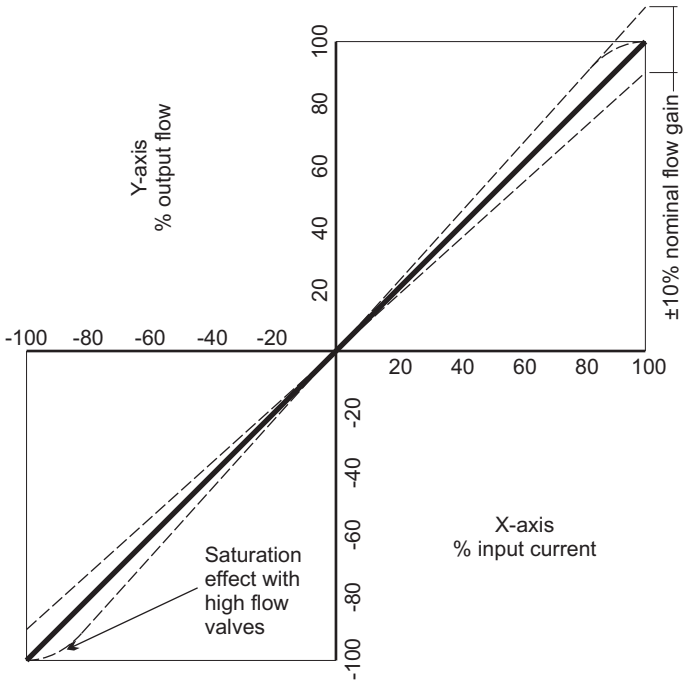
Output flow versus load pressure difference



Internal leakage
This comprises of both pilot stage flow (tare leakage) and the second stage null leakage, typical values for standard spool lap would be:-

Rated flow	Internal leakage at 140 bar
300 l/min	< 4.0 l/min

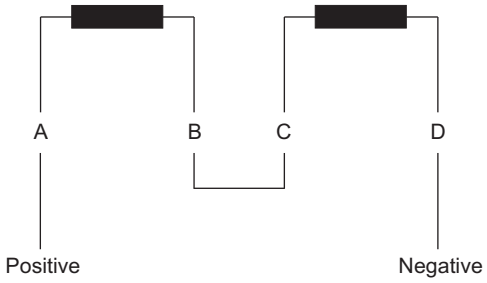
Output flow versus input signal at constant valve pressure drop



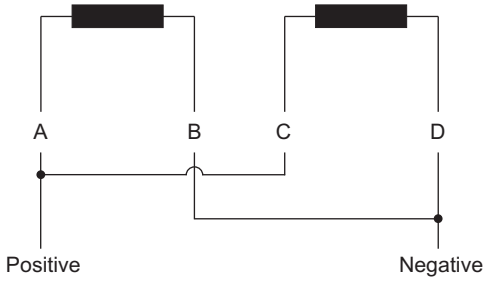
The flow tolerance for standard servovalves is ±10% of the nominal rated flow at ±100% input signal.

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

Coil schematics



Series connection



Parallel connection

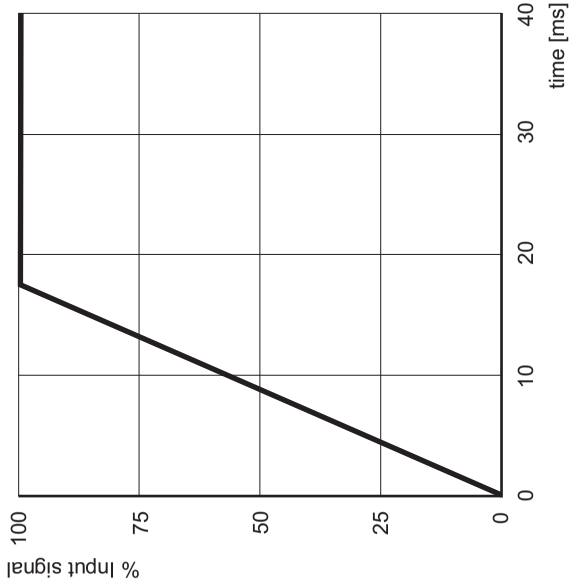
Output flow polarity
Flow in the direction of P➔C2, C1➔R will occur with the pilot stage coils configured as above.

Coil options

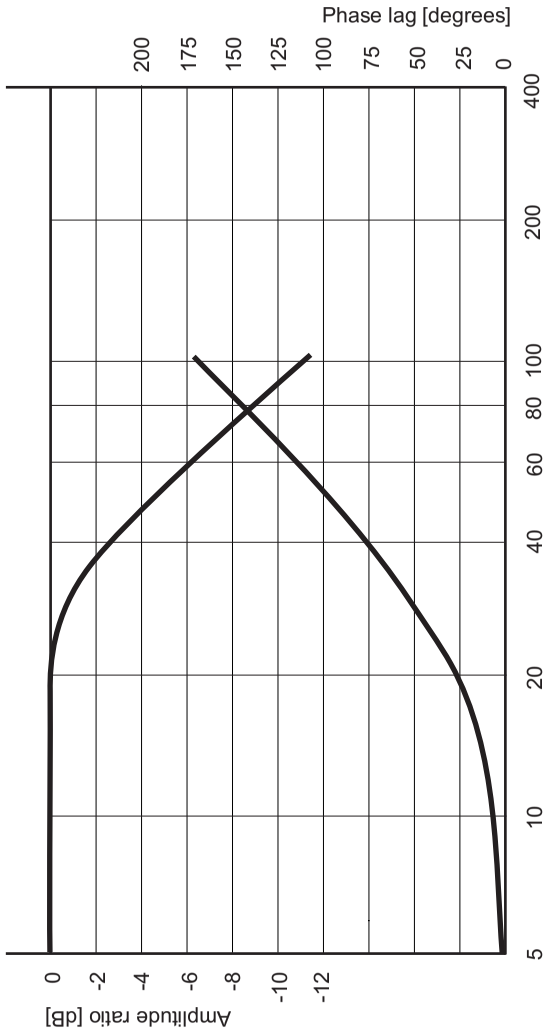
Coil specification		Series connection		Parallel connection	
Rated signal [mA]	Resistance per coil [Ω]	Input current [mA]	Effective resistance [Ω]	Input current [mA]	Effective resistance [Ω]
10	1000	5	2000	10	500
15	200	7.5	400	15	100
15	350	7.5	700	15	175
20	1200	10	2400	20	600
30	300	15	600	30	150
30	800	15	1600	30	400
40	80	20	160	40	40
60	40	30	80	60	20
60	320	30	640	60	160
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.

Transient Response



Frequency Response



1. Suggested mounting bolts M10 x 60 long high tensile steel socket head cap screws

2. 4-way electrical connector, servo coils, mates with MS3106-14S-2S or equivalent.

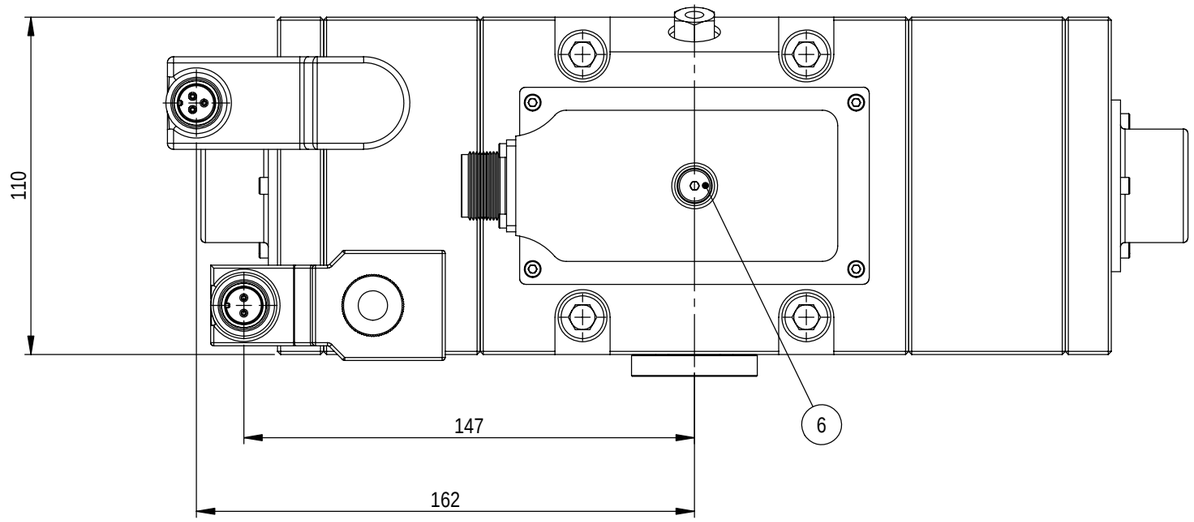
3. 3-way switch, mates with MS3106-10SL-3S or equivalent.

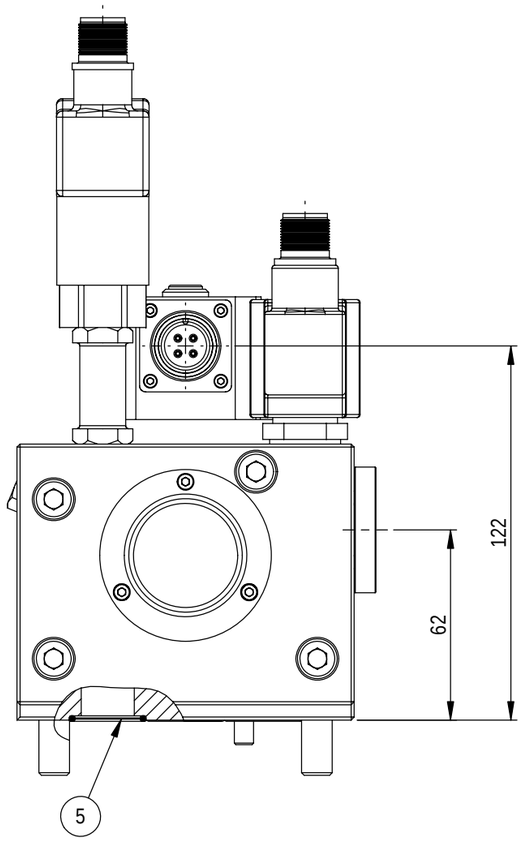
4. 2-way electrical connector, solenoid valve, mates with MS3106-10SL-4S or equivalent.

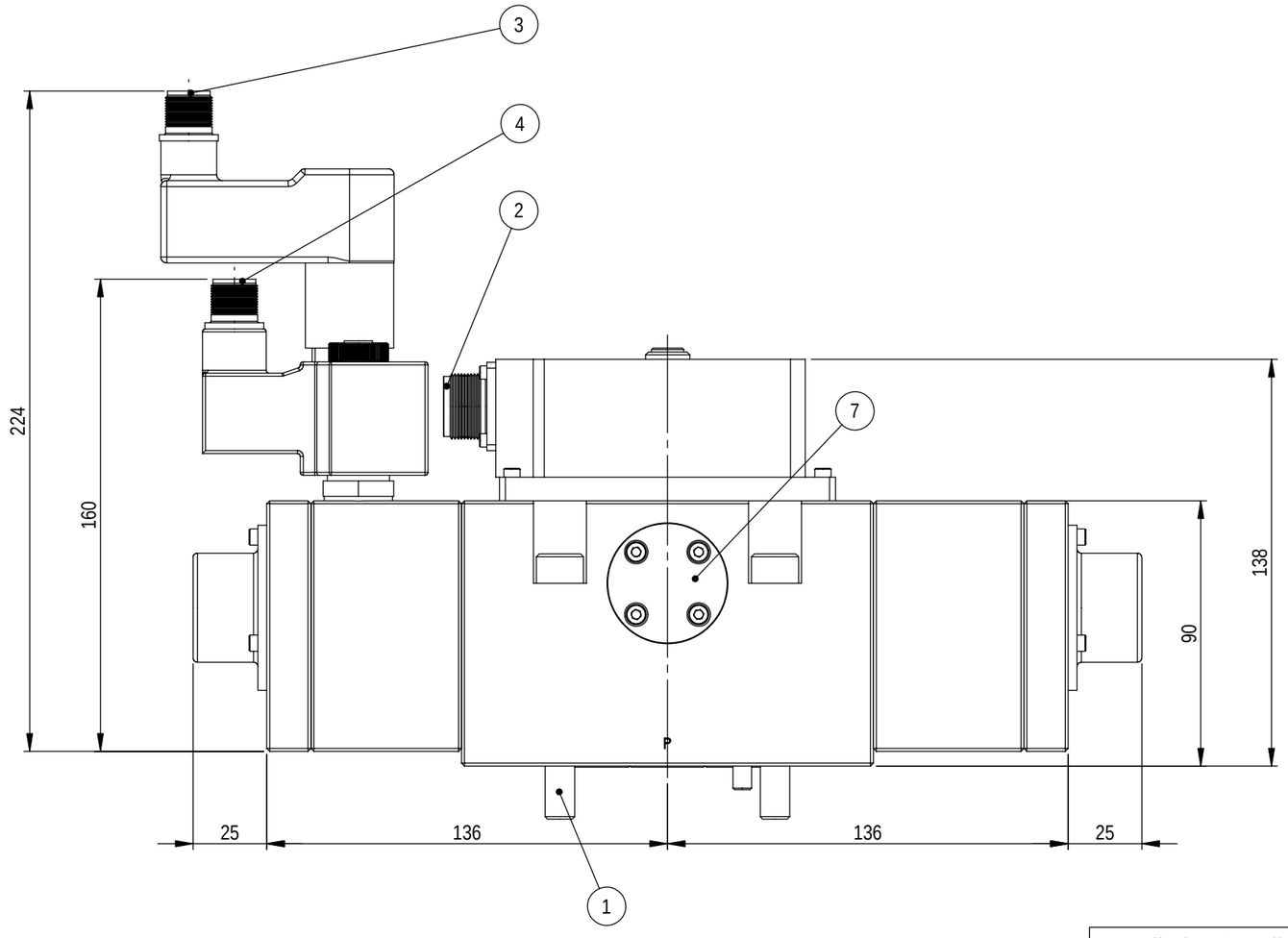
5. Base O-Rings: 21.95 I/D x 1.78 section (4 pcs).

6. Null adjust requires 2.5 A/F allen key.

7. Field replaceable last chance disc filter.

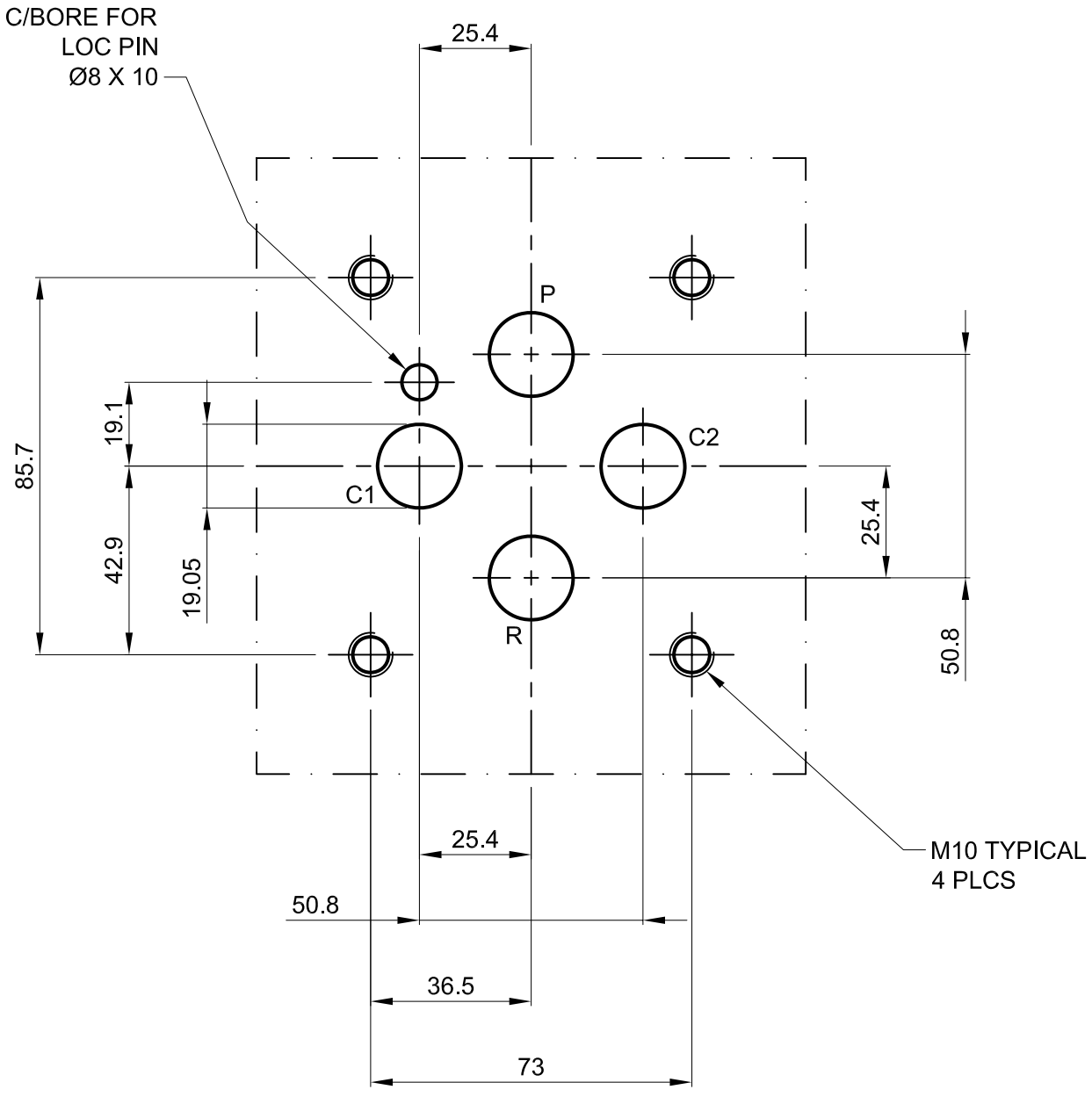






Installation Details Model 990-3

Dimensions in millimeters 3rd Angle Projection



Manifold Dimensions Model 990

Dimensions in millimeters 3rd angle projection	Filename