

star

hydraulics ltd

SERVO TECHNOLOGY
AND RESEARCH

Model 550E Servovalve



- Nominal flows rates 1 to 75 l/min @ 70 bar
- Sapphire Technology
- Spool position control, integrated electronics
- High & Very-High-Response characteristics
- Higher resolution lower hysteresis
- Internal pilot supply

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Nominal flow ratings	4, 10, 20, 40, 60, 75 l/min at 70 bar p For other flow ratings contact factory
Hysteresis	< 0.5% without dither
Threshold	< 0.1% without dither
Null bias	< 1%
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, EPDM
Operating temperature range	-20 °C to 85 °C
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	1.5 kg
Mounting position	Any, fixed or movable

Supply filtration	
minimum	₁₀ 75 (10 micron abs)
recommended	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	3.5 bar
minimum recommended	15 bar
maximum continuous	210 bar (FPM & EPDM) 315 bar (NBR)
Viscosity	VG 10 to 100 ISO 3448
Fluid type	Petroleum based mineral oils For operation with other media contact factory

Calculating output flow

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

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

Where:

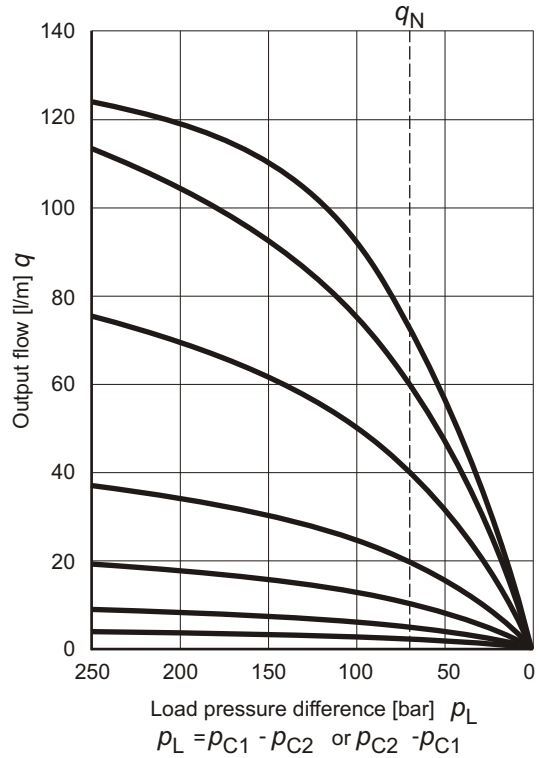
q = Output flow [l/min]

q_N = Rated flow [l/min]

p_N = Valve pressure drop [bar]

p_V = Rated valve pressure drop [bar]

Output flow versus load pressure difference

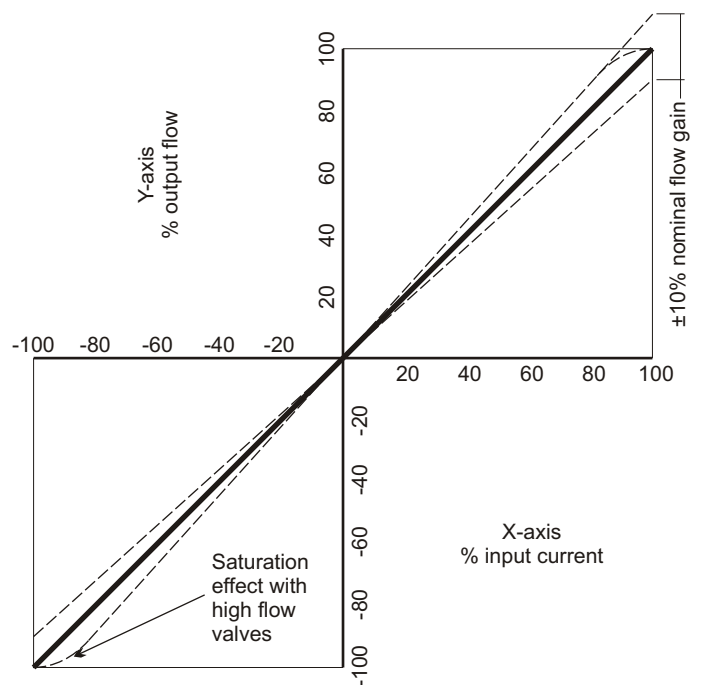


Internal leakage

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

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



Output flow versus input signal at constant valve pressure drop





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

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

Connections

	Pin	Voltage Command	Current Command
Supply voltage +15/0/-15 VDC ±3% Ripple < 50 mV _{p-p}	A	+15 VDC $I_{max} = 200 \text{ mA}$	
	B	-15 VDC $I_{max} = 200 \text{ mA}$	
	C	⊥	
Command signal 	D	0...±10 VDC $R_e = 50 \text{ k}$	0...±10 mA $R_e = 1 \text{ k}$
	E		
Spool position output	F	0...±10 VDC load resistance 10 k	0...±10 VDC load resistance 10 k
	G	Protective grounding	

	Pin	Voltage Command	Current Command
Supply voltage +24 VDC ±3% Ripple < 50 mV _{p-p}	A	+24 VDC $I_{max} = 200 \text{ mA}$	
	B	⊥	
	C	Not used	
Command signal 	D	0...±10 VDC $R_e = 50 \text{ k}$	0...±10 mA $R_e = 1 \text{ k}$
	E		
Spool position output	F	0...±10 VDC load resistance 10 k	0...±10 VDC load resistance 10 k
	G	Protective grounding	

Spool stroke is proportional to command signal. +10 VDC to pin D causes 100% rated flow in the direction of P→C2, C1→R.

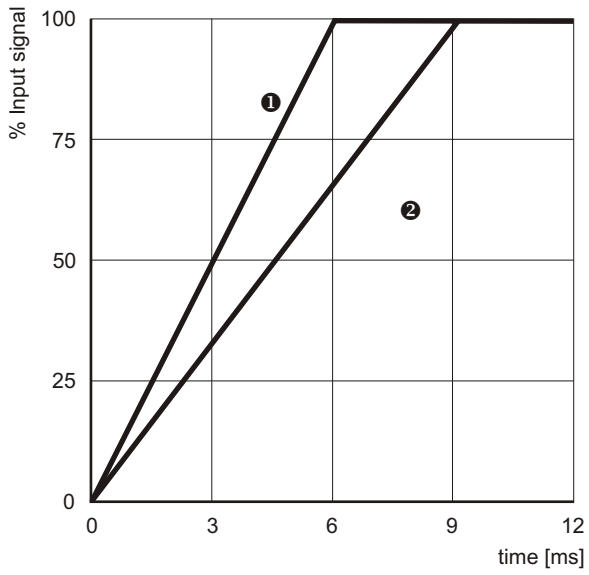
One input D or E must be connected to ⊥ if a single ended driver is used.

Connection cable to be 6-core, 0.75 mm², screened. External diameter 6.5~9.5 mm. Connect screening to ⊥ on supply side only.

Standard connector is MS3106E-14-SA-7S (MIL-C-5015). Please contact factory for more options.

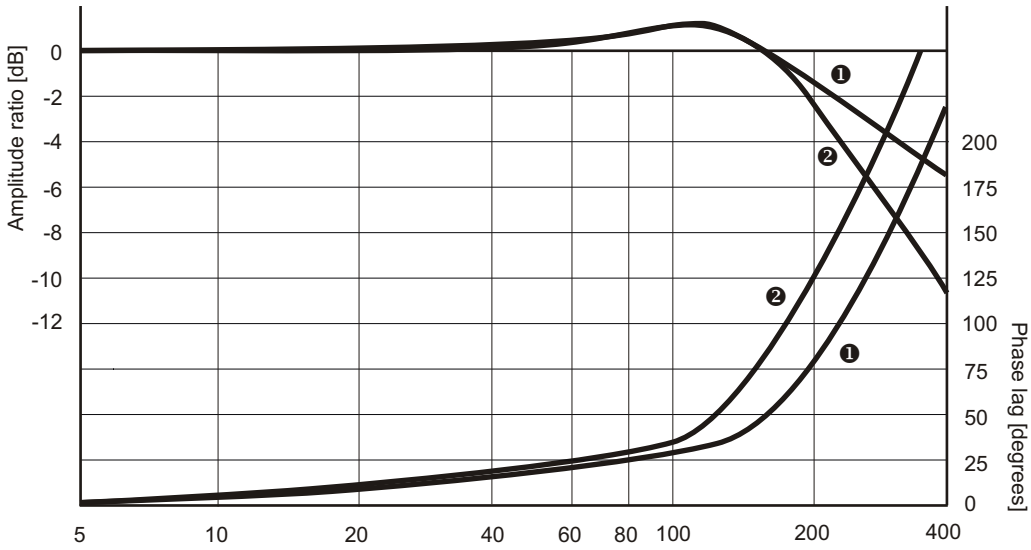


Transient Response (HR)

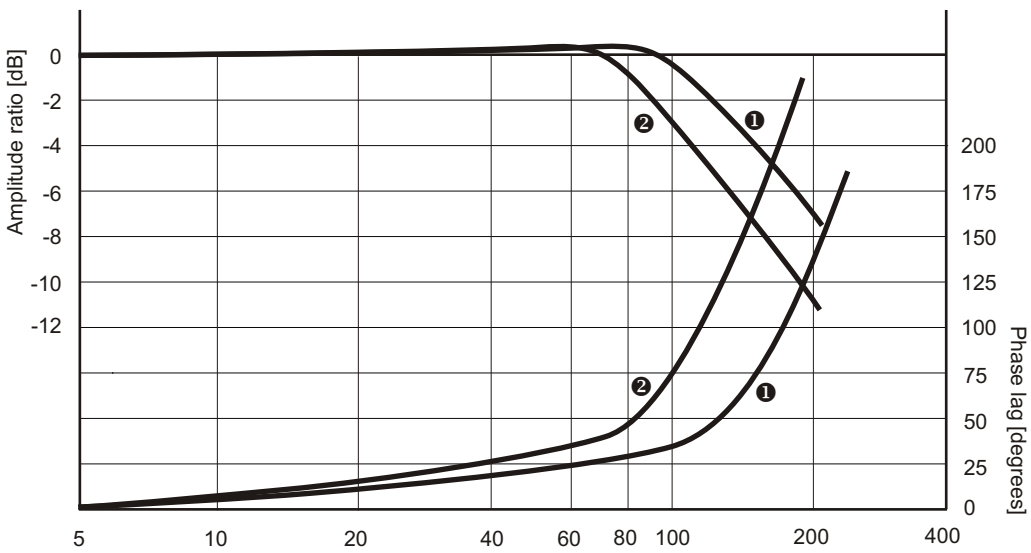


[1] Rated flow = 20 l/min
 [2] Rated flow = 75 l/min
 Supply pressure = 210 bar

Frequency Response (HR)

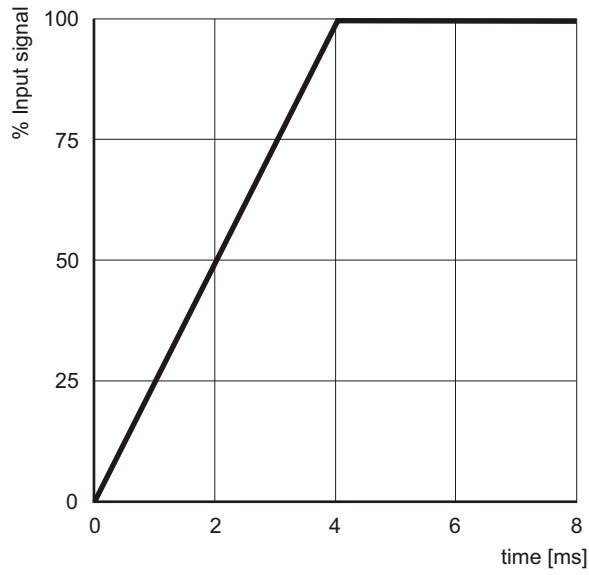


Input signal = 5%
 [1] Rated flow = 20 l/min
 [2] Rated flow = 75 l/min
 Supply pressure = 210 bar



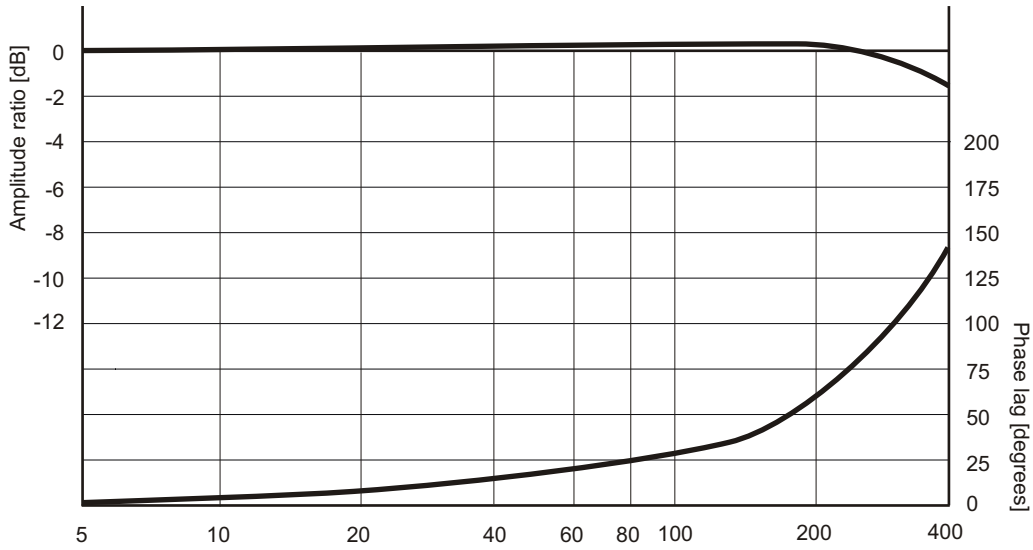
Input signal = 40%
 [1] Rated flow = 20 l/min
 [2] Rated flow = 75 l/min
 Supply pressure = 210 bar

Transient Response (VHR)

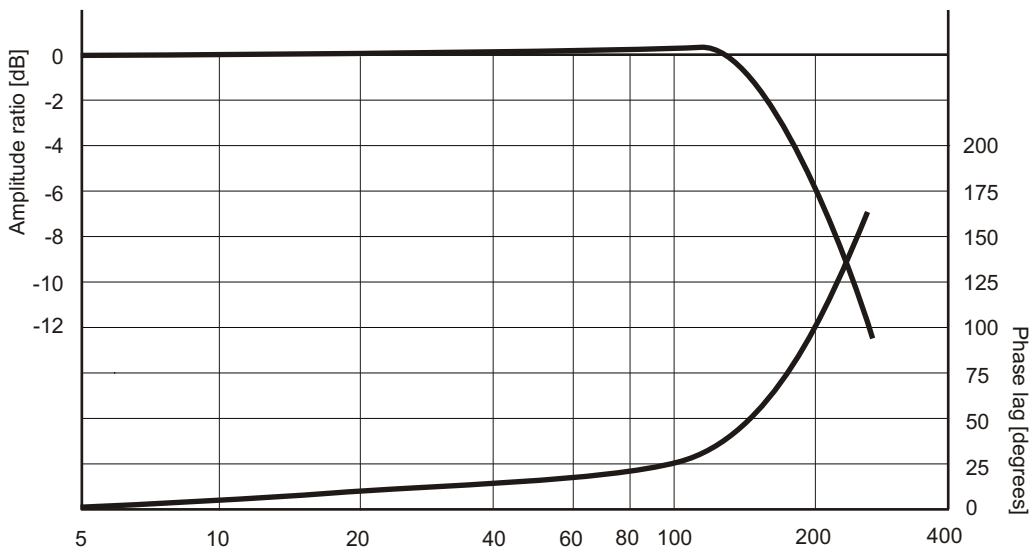


Rated flow = 4 to 40 l/min
Supply pressure = 210 bar

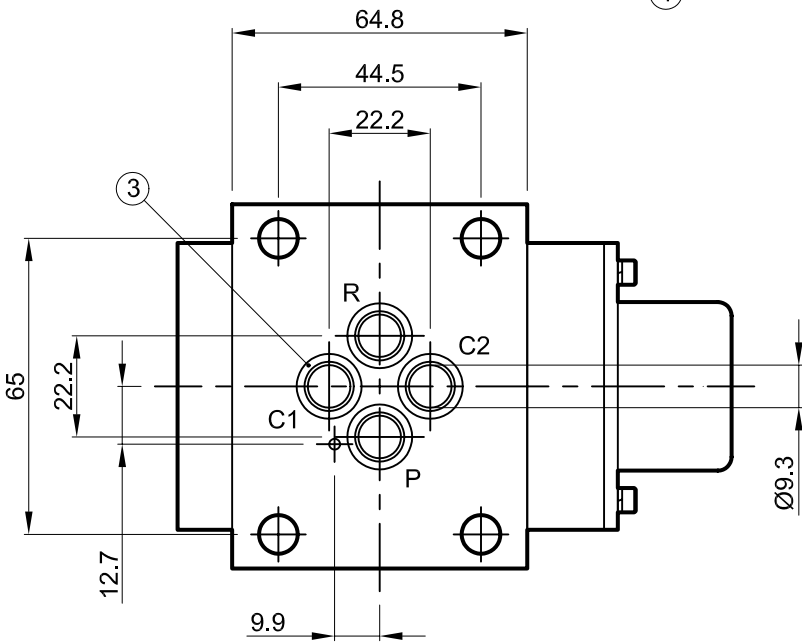
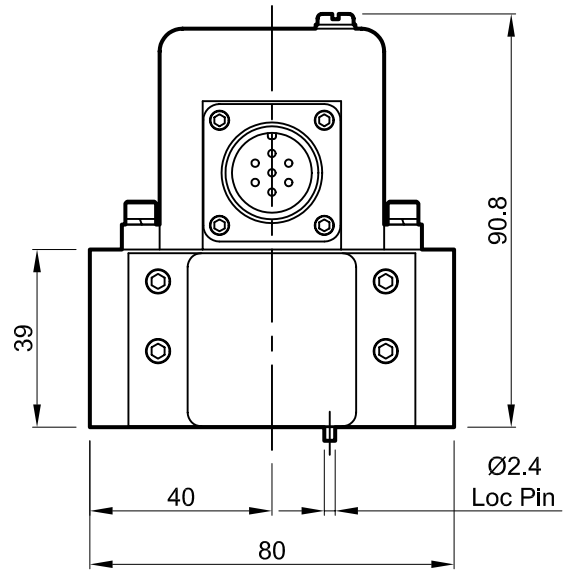
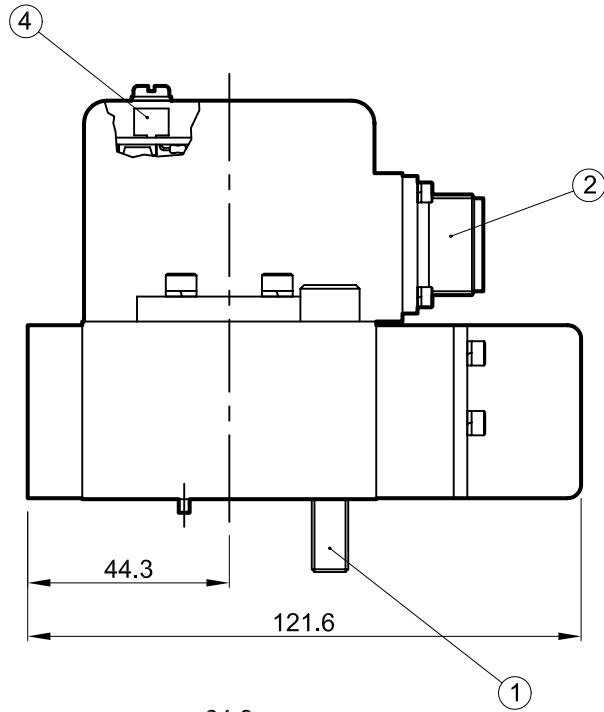
Frequency Response (VHR)



Input signal = 5%
Rated flow = 4 to 40 l/min
Supply pressure = 210 bar



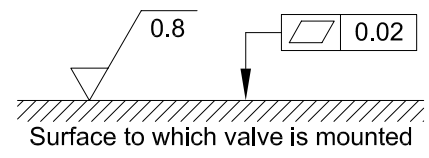
Input signal = 40%
Rated flow = 4 to 40 l/min
Supply pressure = 210 bar



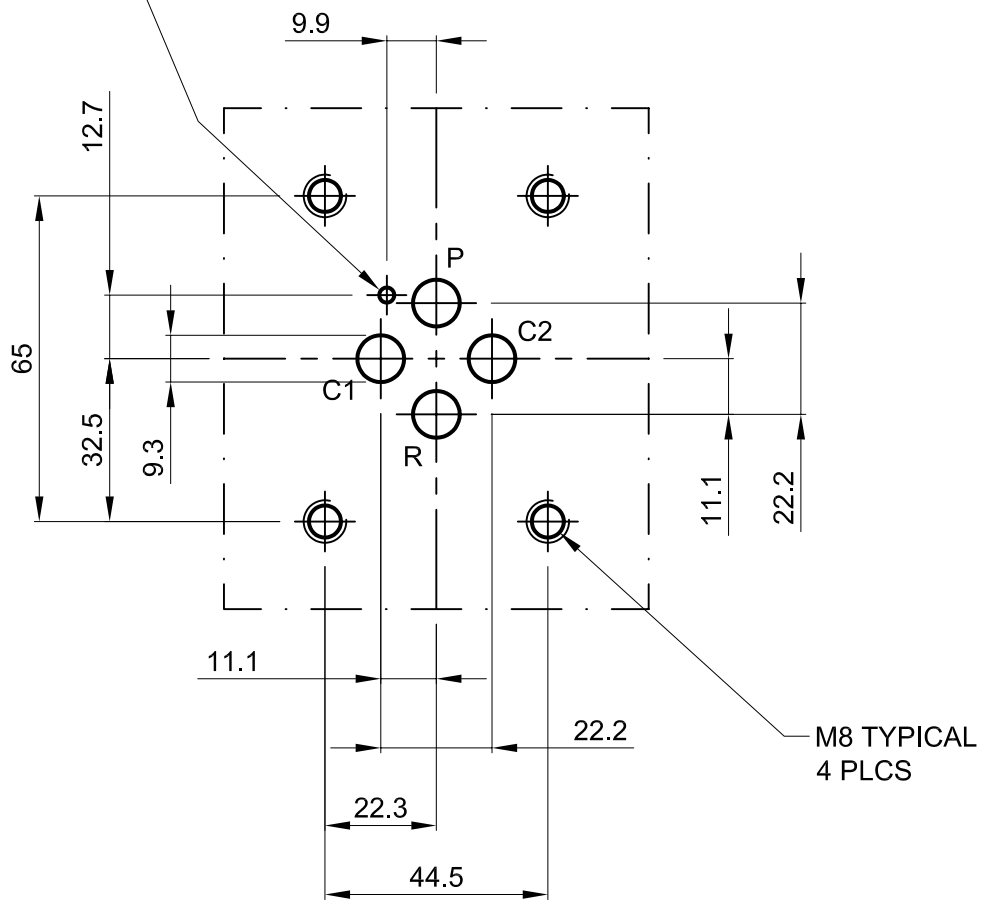
- 1. Suggested mounting bolts M8 x 60 long high tensile steel socket head cap screws.
- 2. 7-way electrical connector mates with MS3106E-14S-A7SN or equivalent. Is available at 180° to position shown (advise desired position at time of order).
- 3. Base O-Rings: 10.82 I/D x 1.78 section (4 pcs).
- 4. Null adjustment potentiometer.

Installation Details Model 550E

Dimensions in millimeters 3rd angle projection	Filename
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C/BORE FOR
LOC PIN
Ø3 X 5



Manifold Dimensions Model 550E

Dimensions in millimeters
3rd angle projection

Filename

