

# 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

**econ**  
FLUID POWER

上海益控精密机械有限公司

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<b>Nominal flow ratings</b>	4, 10, 20, 40, 60, 75 l/min at 70 bar p For other flow ratings contact factory
<b>Hysteresis</b>	< 0.5% without dither
<b>Threshold</b>	< 0.1% without dither
<b>Null bias</b>	< 1%
<b>Null shift</b>	
with 40°C temp change	< 2%
with 70 bar supply pressure change	< 2%
with return pressure 0 to 35 bar	< 2%
<b>Pressure gain</b>	< 1% rated input signal for 60% of supply pressure
<b>Seal materials available</b>	FPM, NBR, EPDM
<b>Operating temperature range</b>	-20 °C to 85 °C
<b>Proof pressure</b>	
at pressure port	150% max supply pressure
at return port	100% max supply pressure
<b>Burst pressure</b>	
return port open	250% max supply pressure
<b>External leakage</b>	zero
<b>Degree of protection</b>	IP 65 (BS EN 60529 : 1992)
<b>Weight</b>	1.5 kg
<b>Mounting position</b>	Any, fixed or movable

<b>Supply filtration</b>	
minimum	<sub>10</sub> 75 (10 micron abs)
recommended	<sub>5</sub> = 200 (5 micron abs)
<b>Fluid cleanliness level</b>	
minimum	ISO 4406 - 16/13    NAS 1638 - class 7
recommended	ISO 4406 - 13/10    NAS 1638 - class 4
<b>Supply pressure</b>	
min. to effect spool movement	3.5 bar
minimum recommended	15 bar
maximum continuous	210 bar (FPM & EPDM)    315 bar (NBR)
<b>Viscosity</b>	VG 10 to 100 ISO 3448
<b>Fluid type</b>	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:

$$q = q_N \sqrt{\frac{\rho_N}{\rho_V}}$$

Where:

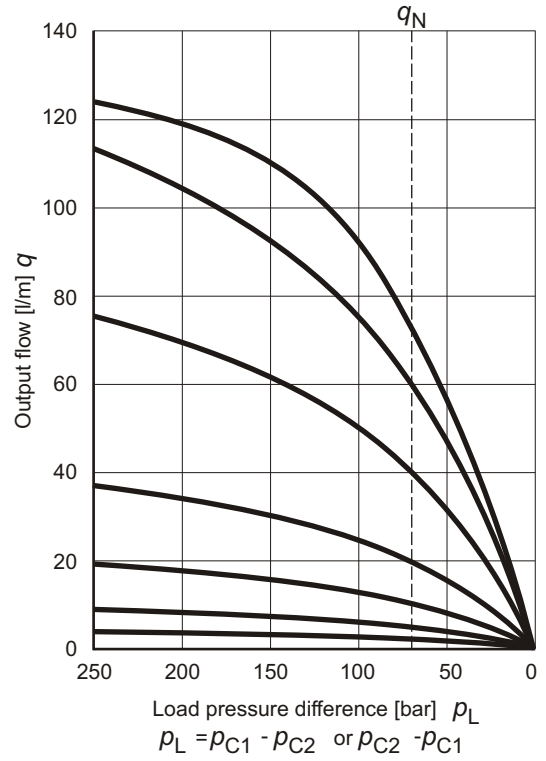
$q$  = Output flow [l/min]

$q_N$  = Rated flow [l/min]

$\rho_N$  = Valve pressure drop [bar]

$\rho_V$  = Rated valve pressure drop [bar]

**Output flow versus load pressure difference**

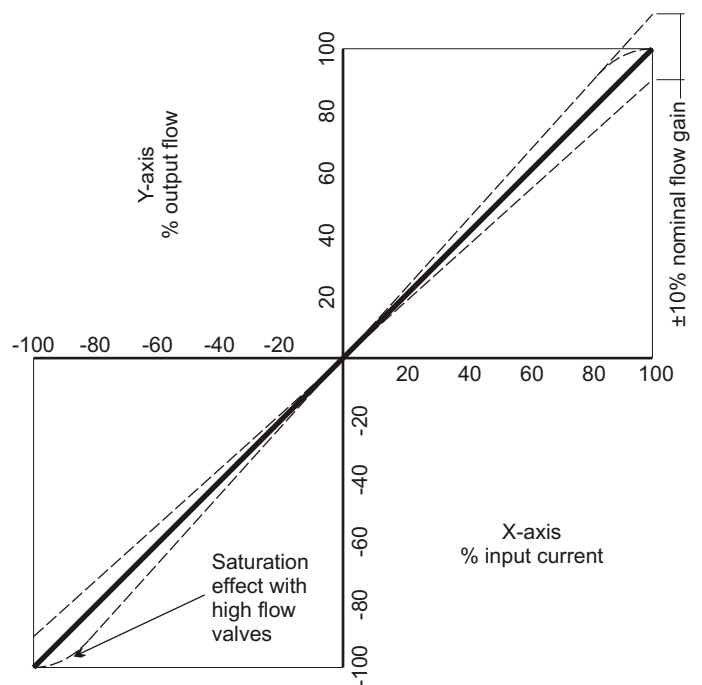


**Internal leakage**

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 <sub>p-p</sub>	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 <sub>p-p</sub>	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.

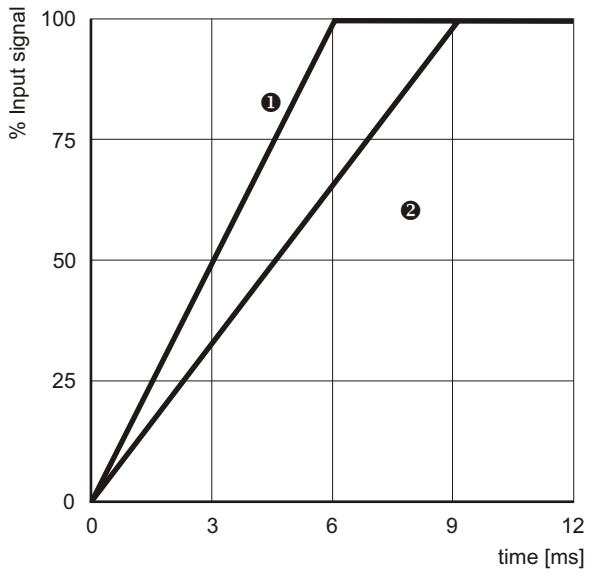
One input D or E must be connected to ⊥ if a single ended driver is used.

Connection cable to be 6-core, 0.75 mm<sup>2</sup>, 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.

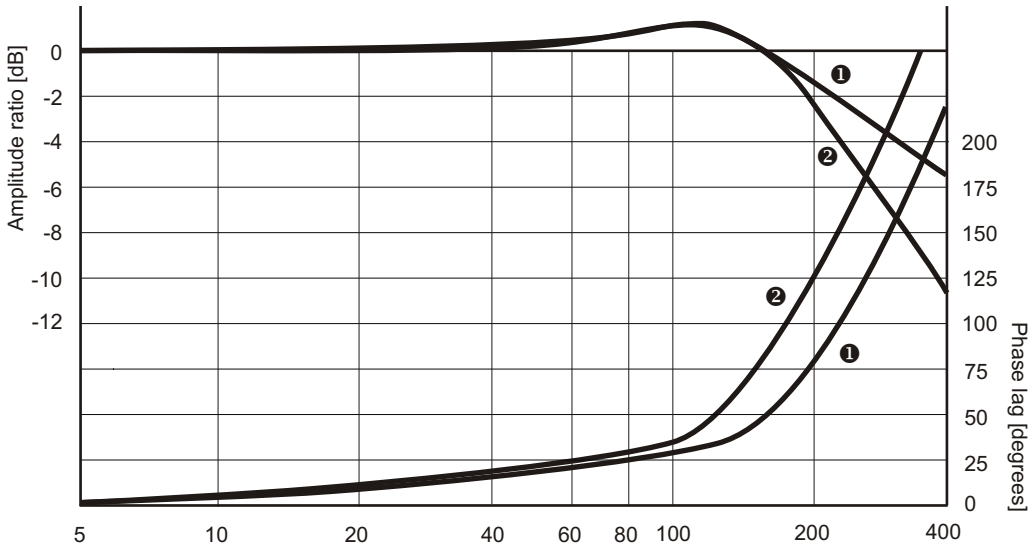


# Transient Response (HR)

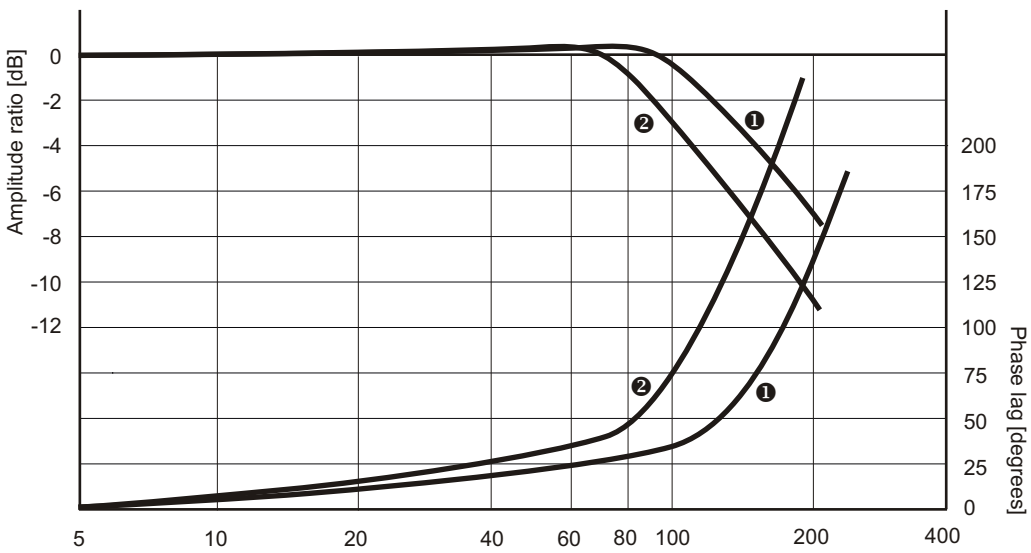


[1] Rated flow = 20 l/min  
 [2] Rated flow = 75 l/min  
 Supply pressure = 210 bar

# Frequency Response (HR)

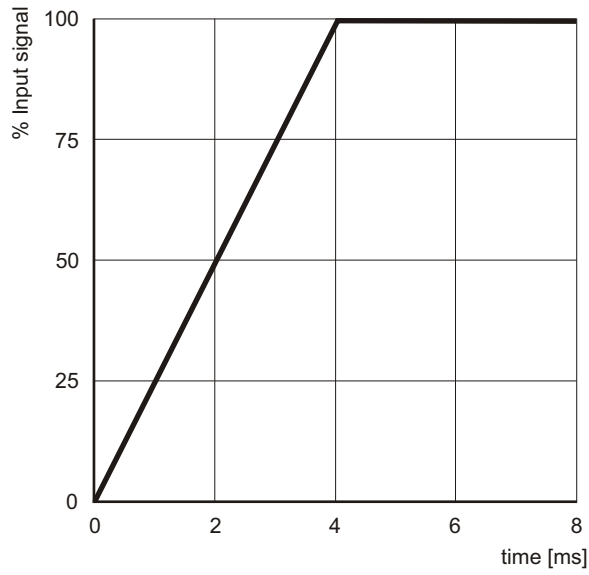


Input signal = 5%  
 [1] Rated flow = 20 l/min  
 [2] Rated flow = 75 l/min  
 Supply pressure = 210 bar



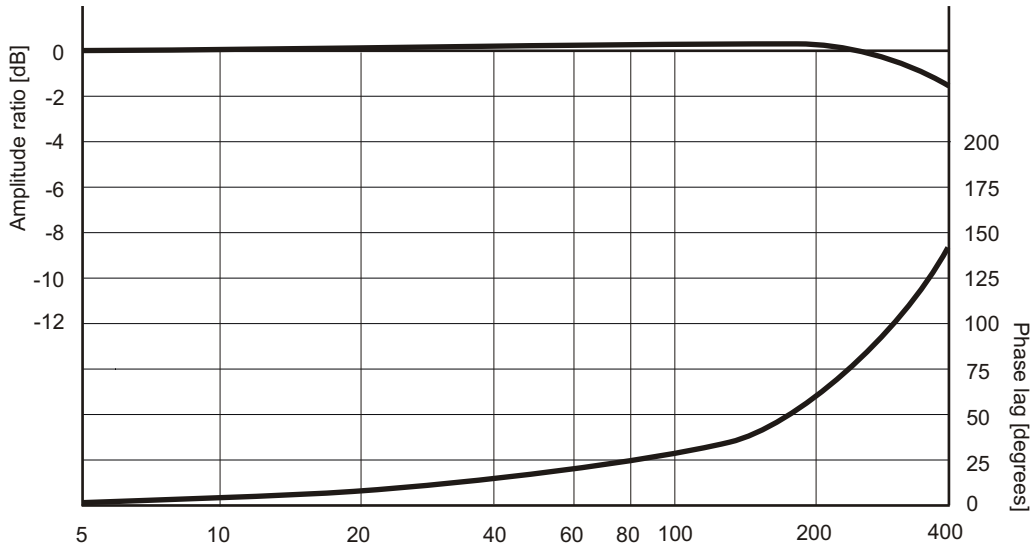
Input signal = 40%  
 [1] Rated flow = 20 l/min  
 [2] Rated flow = 75 l/min  
 Supply pressure = 210 bar

# Transient Response (VHR)

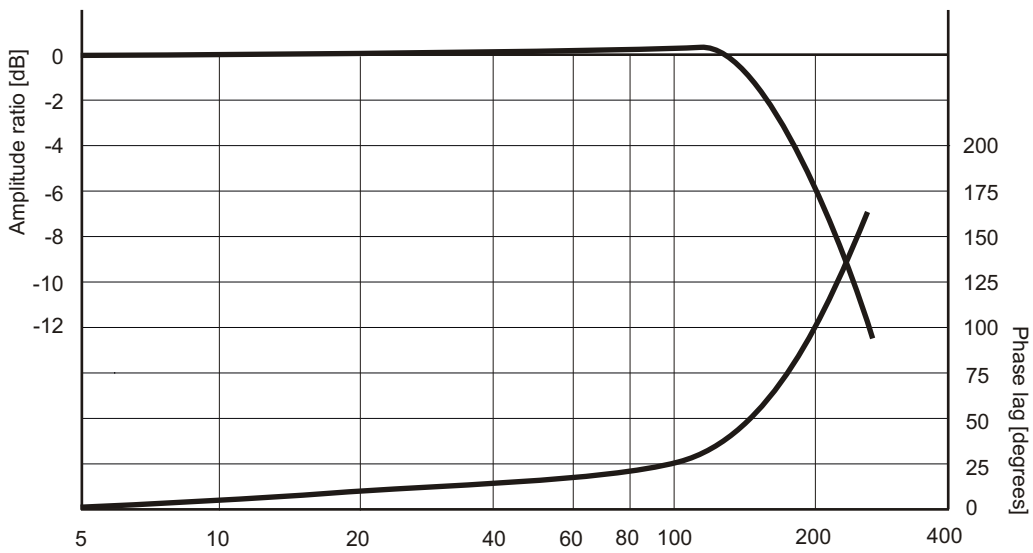


Rated flow = 4 to 40 l/min  
Supply pressure = 210 bar

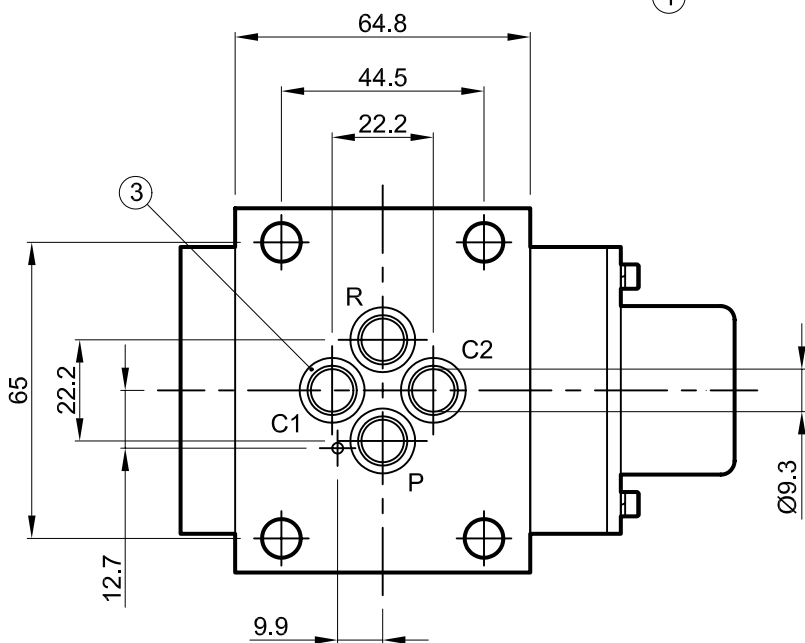
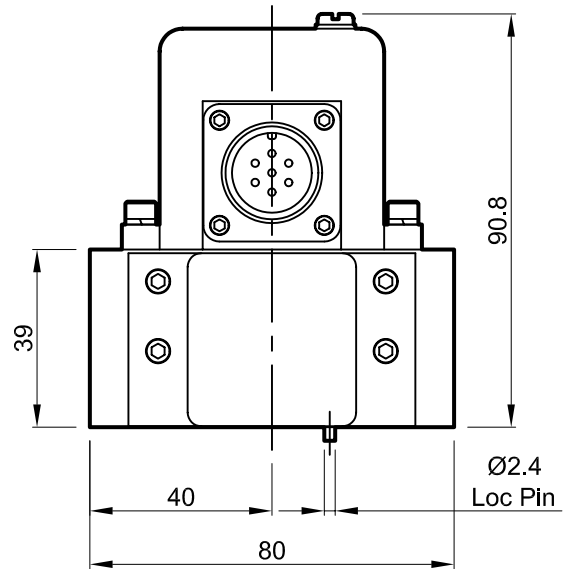
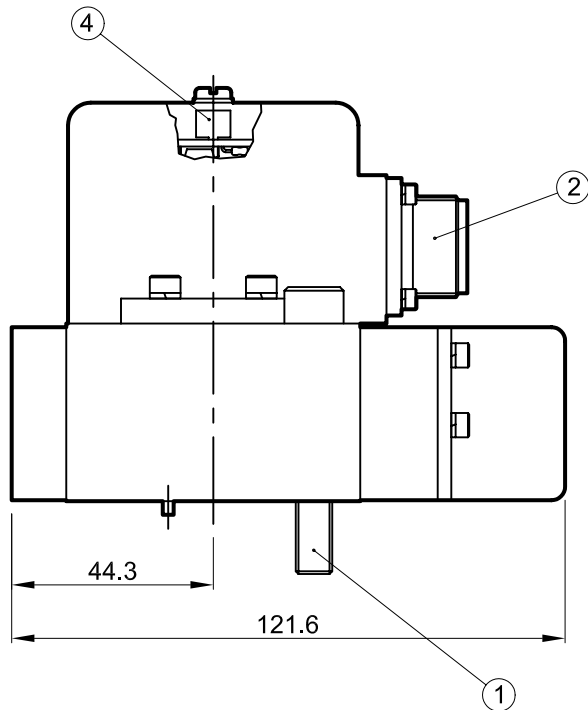
# Frequency Response (VHR)



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-14-SA-7S or equivalent. Is available at 180° to position shown (advise desired position at time of order).

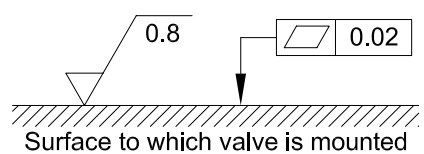
3. Base O-Rings: 10.82 I/D x 1.78 section (4 pcs).

4. Null adjustment potentiometer.

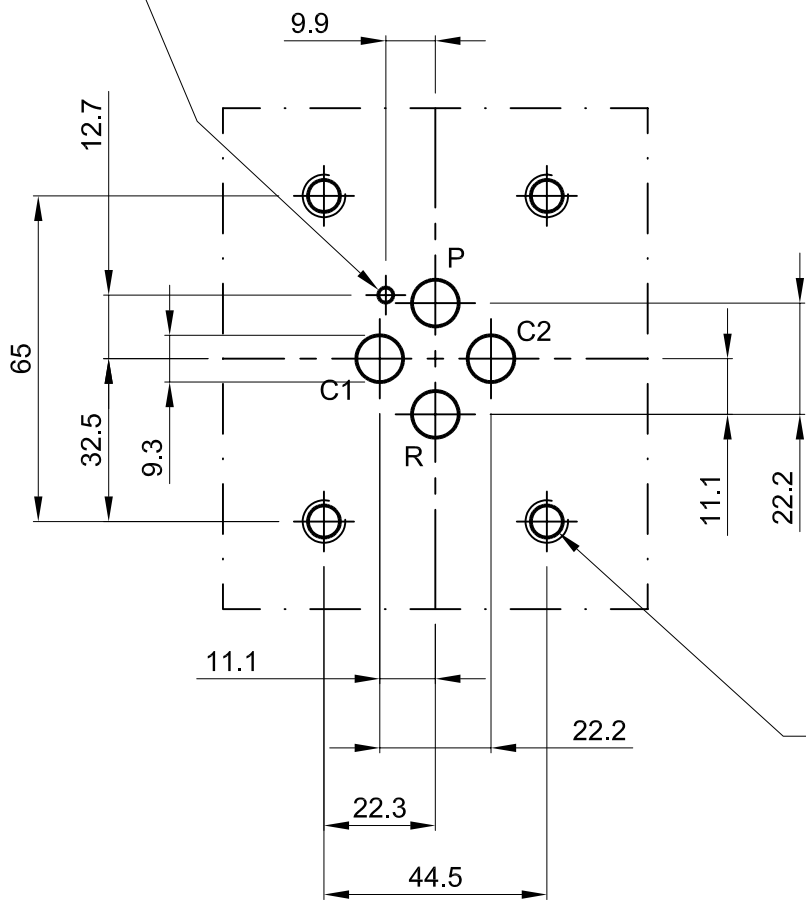
## Installation Details Model 550E

Dimensions in millimeters  
3rd angle projection

Filename  
ID550E-3Q03-En



C/BORE FOR  
LOC PIN  
Ø3 X 5



M8 TYPICAL  
4 PLCS

# Manifold Dimensions Model 550E

Dimensions in millimeters  
3rd angle projection

Filename  
MD550E-1Q03-En

