

static_error_K(sys)

Finds the static error constants of a system.

```
s = tf('s');  
  
G = (s+1)/(s^2+3*s)
```

G =

$$\frac{s + 1}{s^2 + 3 s}$$

Continuous-time transfer function.

```
ELAB.static_error_K(G, true)
```

Static error constants:
Position:
As $s \rightarrow 0$, $G(s) \rightarrow K_p = \text{Inf}$
Velocity:
As $s \rightarrow 0$, $s*G(s) \rightarrow K_v = 0.33$
Acceleration:
As $s \rightarrow 0$, $s^2*G(s) \rightarrow K_a = 0.00$
Steady-state error e_{ss} :
Step: 0 Ramp: 1/K Accel: Inf
ans = Inf

```
G = (s+2)*(s+3)/((s+1)*(s+4))
```

G =

$$\frac{s^2 + 5 s + 6}{s^2 + 5 s + 4}$$

Continuous-time transfer function.

```
ELAB.static_error_K(G, true)
```

Static error constants:
Position:
As $s \rightarrow 0$, $G(s) \rightarrow K_p = 1.50$
Velocity:
As $s \rightarrow 0$, $s*G(s) \rightarrow K_v = 0.00$
Acceleration:
As $s \rightarrow 0$, $s^2*G(s) \rightarrow K_a = 0.00$
Steady-state error e_{ss} :
Step: 1/(1+K) Ramp: Inf Accel: Inf
ans = 1.5000

```
G = (s^4+4*s^3+3*s^2+s)/(3*s^4+6*s^3+2*s^2)
```

G =

$$s^4 + 4 s^3 + 3 s^2 + s$$

$$3s^4 + 6s^3 + 2s^2$$

Continuous-time transfer function.

```
ELAB.static_error_K(G,true);
```

Static error constants:

Position:

As $s \rightarrow 0$, $G(s) \rightarrow K_p = \text{Inf}$

Velocity:

As $s \rightarrow 0$, $sG(s) \rightarrow K_v = 0.50$

Acceleration:

As $s \rightarrow 0$, $s^2G(s) \rightarrow K_a = 0.00$

Steady-state error e_{ss} :

Step: 0 Ramp: 0 Accel: 1/K