

## TECHNICAL PRODUCT INFORMATION

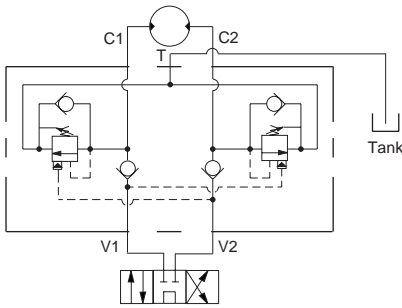
### CUSHION LOCK VALVES

#### Applications

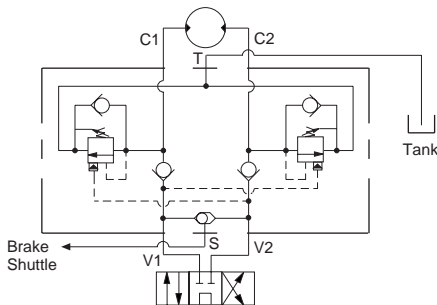
The cushion lock circuit is used to control the acceleration, and deceleration of reciprocating or rotary reversing circuits. Most slewing type circuits have inertia loads and it is important that there is a facility to ensure that during operation there is good control of the motion. The cushion lock provides this type of control using counterbalance valves as both a relief for acceleration and providing a braking resistance during deceleration.

Sun offers four basic types of cushion lock valves:

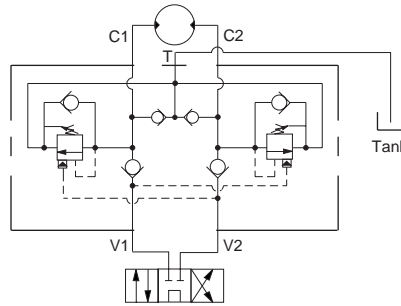
1. The basic dual counterbalance valve assembly with the check valves in supply lines and separate tank return line.



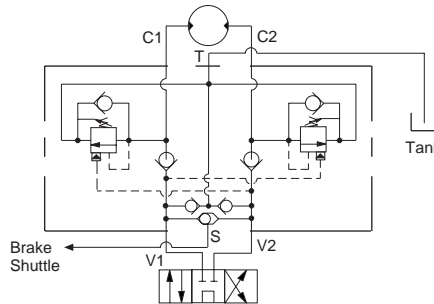
2. The basic assembly as above but with a shuttle valve to release a spring-applied mechanical brake.



3. The assembly that incorporates the same features as version 1. but with additional anti-cavitation check valves from the external tank line to the service lines.



4. The assembly as in version 3. but with a shuttle valve to release a spring-applied mechanical brake.



#### Design Concepts and Features

The use of counterbalance valves provides smooth control of the motion because the valves are modulating load control valves.

The valves are also seated so provide good load locking capability, although on most motor applications a mechanical brake supplements this because there is always leakage across the motor.

A wide range of pilot ratios and pressure ratings are available for the counterbalance valves to enable the most suitable valves to be selected for the application.

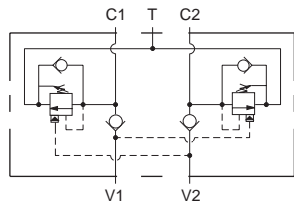
The check valves used for anti-cavitation have low cracking pressure of 5 psi to create the least resistance.

The valves are also available in ISO sandwiches or could be made in custom manifolds to suit a particular application.

Standard Assemblies: Cushion Lock Valves

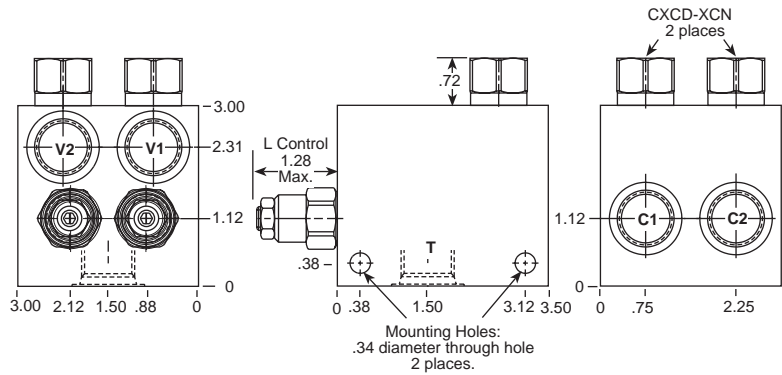
DUAL LOAD CONTROL APPLICATIONS  
(TWO CAVITY WITH CHECKS)

PILOT RATIOS  
1.5:1, 2:1, 2.3:1, 3:1, 4.5:1, 10:1



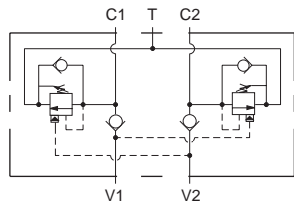
Ports C1, C2 V1, V2	Port T	Assembly Model Code*
3/8" NPTF	1/2" NPTF	CBC*-L*N-EMB
1/2" NPTF	1/2" NPTF	CBC*-L*N-EMC
SAE-8	SAE-10	CBC*-L*N-EMJ
SAE-10	SAE-10	CBC*-L*N-EMK

0-15 GPM Cavity T-11A

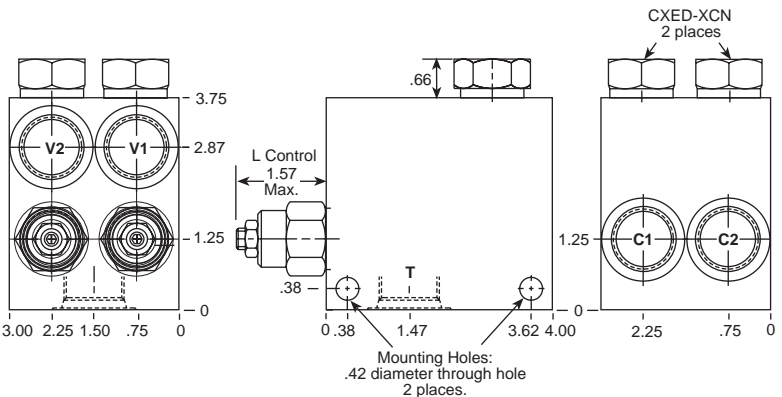


\*Add modifier /S to order Ductile Iron for pressure rating over 3000 psi.

0-30 GPM Cavity T-2A



Ports C1, C2 V1, V2	Port T	Assembly Model Code*
1/2" NPTF	3/4" NPTF	CBE*-L*N-BMC
3/4" NPTF	3/4" NPTF	CBE*-L*N-BMD
SAE-10	SAE-12	CBE*-L*N-BMK
SAE-12	SAE-12	CBE*-L*N-BML



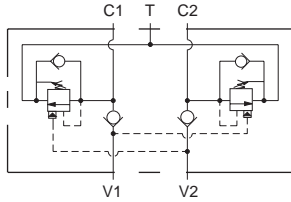
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NOTES: Page 50 for cartridge model CB\*\*-\* and page 102 for CX\*D-\* shows performance curves, technical tips, and options. See page vii for technical information about line mount bodies including SAE flange pattern specifications. Consult your local Sun Distributor or the Sun Web Site for other port sizes available in the bodies shown above. Go to [www.sunhydraulics.com](http://www.sunhydraulics.com) for more product information and pricing.

## Standard Assemblies: Cushion Lock Valves

# DUAL LOAD CONTROL APPLICATIONS (TWO CAVITY WITH CHECKS)

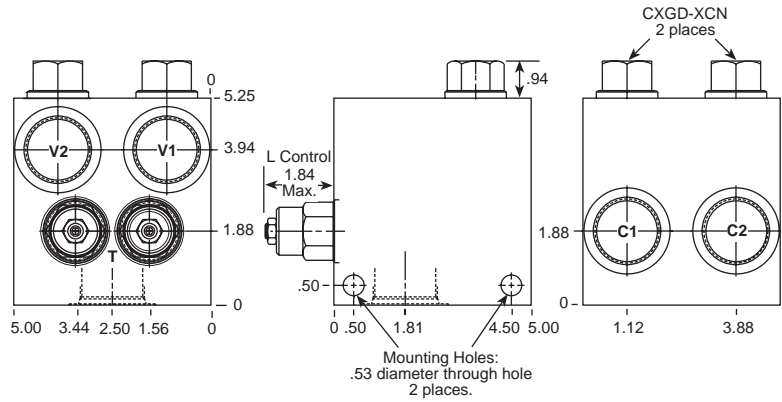
**PILOT RATIOS**  
1.5:1, 2:1, 2.3:1, 3:1, 4.5:1, 10:1



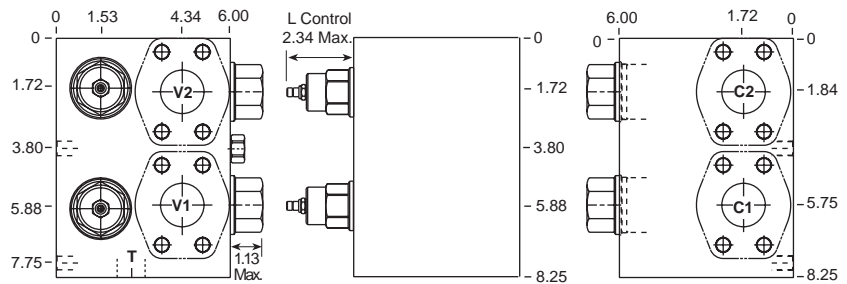
Ports C1, C2 V1, V2	Port T	Assembly Model Code*
1" NPTF	1 1/4" NPTF	<b>CBG*-L*N-HME</b>
1 1/4" NPTF	1 1/4" NPTF	<b>CBG*-L*N-HMF</b>
SAE-16	SAE-20	<b>CBG*-L*N-HMM</b>
SAE-20	SAE-20	<b>CBG*-L*N-HMN</b>

\*Add modifier /S to order Ductile Iron for pressure rating over 3000 psi.

### 0-60 GPM Cavity T-17A



### 0-120 GPM Cavity T-19A



Model Code	Pilot Ratio
YCJD-L*N-AR	3:1
YCJD-L*N-GR	4.5:1
YCJD-L*N-HR	10:1

\*Add modifier /S to order Ductile Iron for pressure rating over 3000 psi.

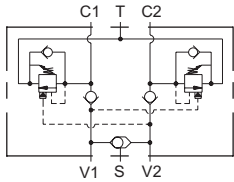
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Standard Assemblies: Cushion Lock Valves

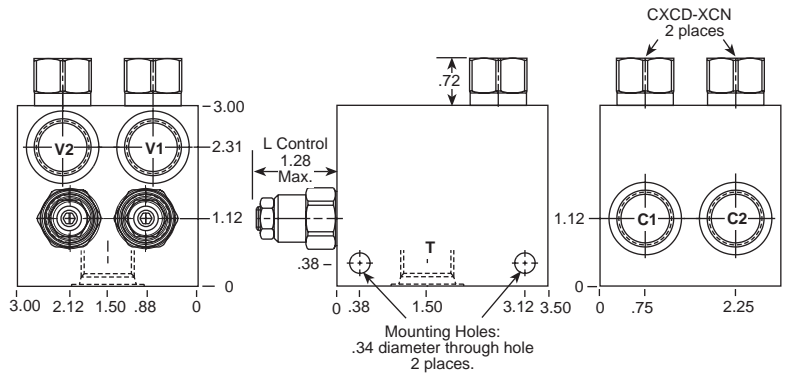
DUAL LOAD CONTROL APPLICATIONS  
(TWO CAVITY WITH CHECKS AND SHUTTLE)

PILOT RATIOS  
1.5:1, 2:1, 2.3:1, 3:1, 4.5:1, 10:1

0-15 GPM Cavity T-11A

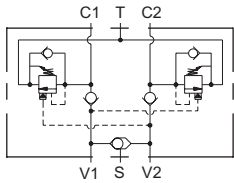


Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
3/8" NPTF	1/2" NPTF	1/4" NPTF	CBC*-L*N-ENB
1/2" NPTF	1/2" NPTF	1/4" NPTF	CBC*-L*N-ENC
SAE-8	SAE-10	SAE-4	CBC*-L*N-ENJ
SAE-10	SAE-10	SAE-4	CBC*-L*N-ENK

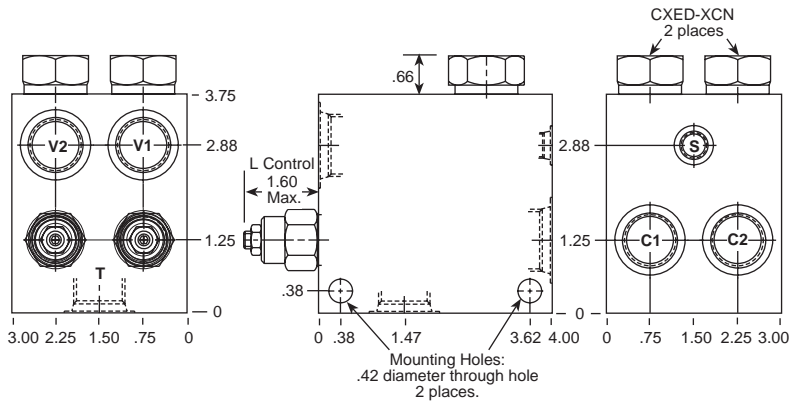


\*Add modifier /S to order Ductile Iron for pressure rating over 3000 psi.

0-30 GPM Cavity T-2A



Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
1/2" NPTF	3/4" NPTF	1/4" NPTF	CBE*-L*N-BNC
3/4" NPTF	3/4" NPTF	1/4" NPTF	CBE*-L*N-BND
SAE-10	SAE-12	SAE-4	CBE*-L*N-BNK
SAE-12	SAE-12	SAE-4	CBE*-L*N-BNL



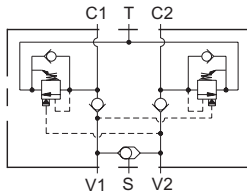
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## Standard Assemblies: Cushion Lock Valves

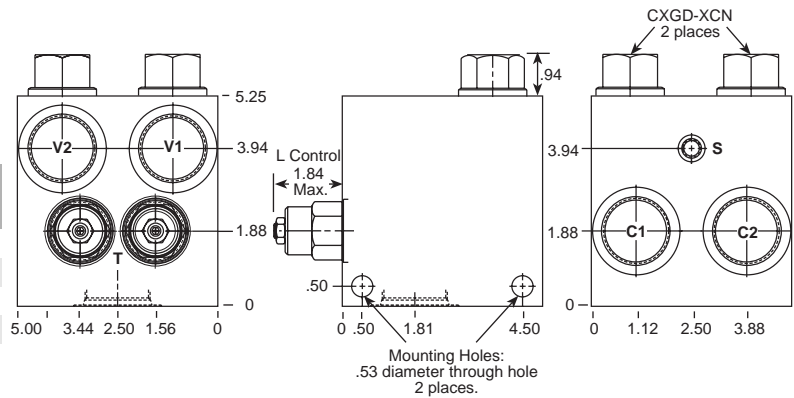
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**PILOT RATIOS**  
1.5:1, 2:1, 2.3:1, 3:1, 4.5:1, 10:1



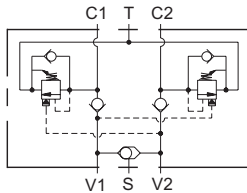
Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
1" NPTF	1 1/4" NPTF	1/4" NPTF	<b>CBC*-L*N-HNE</b>
1 1/4" NPTF	1 1/4" NPTF	1/4" NPTF	<b>CBC*-L*N-HNF</b>
SAE-16	SAE-20	SAE-4	<b>CBC*-L*N-HNM</b>
SAE-20	SAE-20	SAE-4	<b>CBC*-L*N-HNN</b>

### 0-60 GPM Cavity T-17A

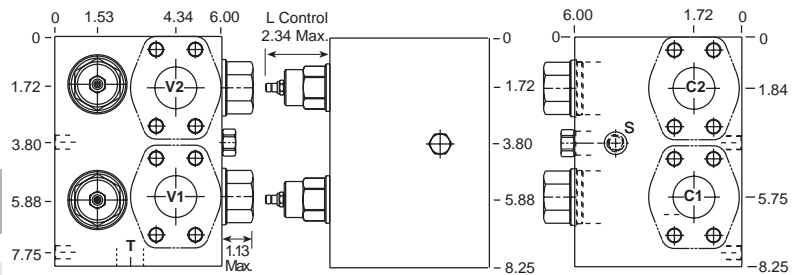


\*Add modifier **/S** to order Ductile Iron for pressure rating over 3000 psi.

### 0-120 GPM Cavity T-19A



Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
1 1/2" SAE C61	1 3/8" NPTF	1/4" NPTF	<b>YCJH-L*N-AR</b>
1 1/2" SAE C61	1 3/8" NPTF	1/4" NPTF	<b>YCJH-L*N-GR</b>
1 1/2" SAE C61	1 3/8" NPTF	SAE-4	<b>YCJH-L*N-HR</b>



Model Code	Pilot Ratio
YCJH-L*N-AR	3:1
YCJH-L*N-GR	4.5:1
YCJH-L*N-HR	10:1

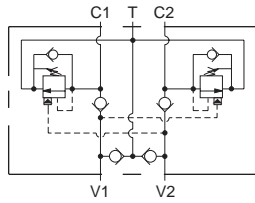
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**Standard Assemblies: Cushion Lock Valves**

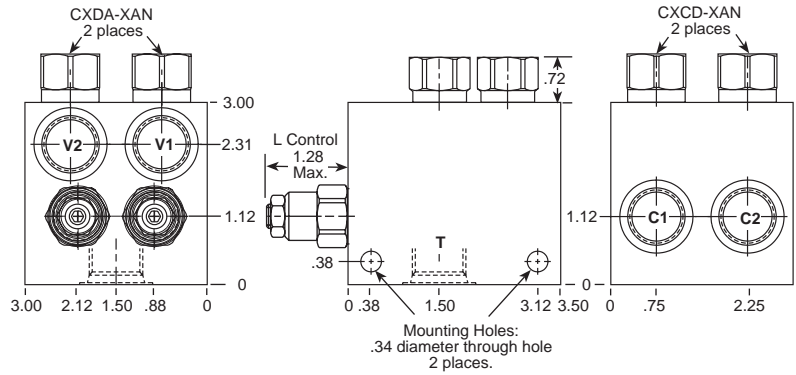
**DUAL LOAD CONTROL APPLICATIONS  
(TWO CAVITY WITH ANTI-CAVITATION CHECKS)**

**PILOT RATIOS  
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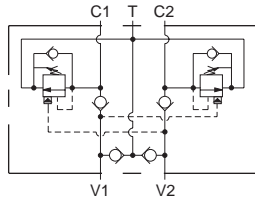
Ports C1, C2 V1, V2	Port T	Assembly Model Code*
3/8" NPTF	1/2" NPTF	<b>CBC*-L*N-EPB</b>
1/2" NPTF	1/2" NPTF	<b>CBC*-L*N-EPC</b>
SAE-8	SAE-10	<b>CBC*-L*N-EPJ</b>
SAE-10	SAE-10	<b>CBC*-L*N-EPK</b>

**0-15 GPM Cavity T-11A**

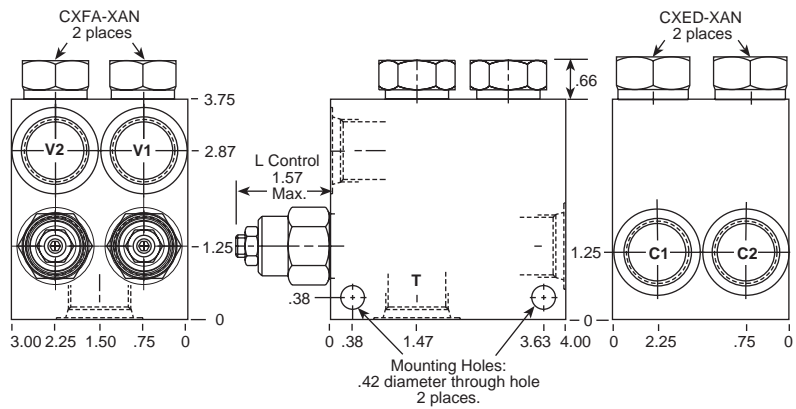


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**0-30 GPM Cavity T-2A**



Ports C1, C2 V1, V2	Port T	Assembly Model Code*
1/2" NPTF	1/2" NPTF	<b>CBE*-L*N-BPC</b>
3/4" NPTF	3/4" NPTF	<b>CBE*-L*N-BPD</b>
SAE-10	SAE-12	<b>CBE*-L*N-BPK</b>
SAE-12	SAE-12	<b>CBE*-L*N-BPL</b>



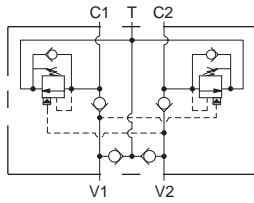
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**Standard Assemblies: Cushion Lock Valves**

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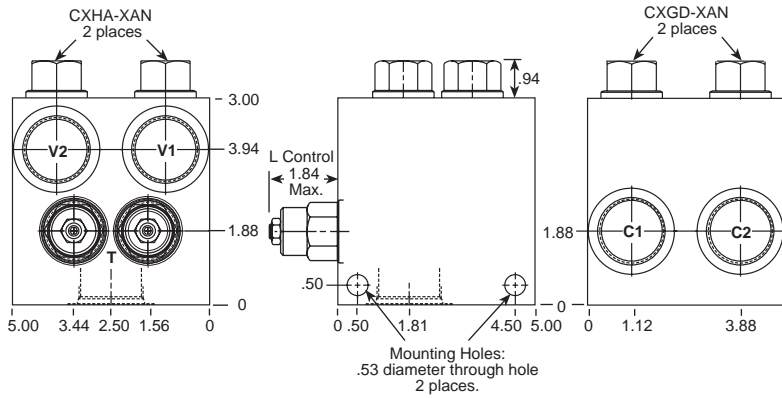
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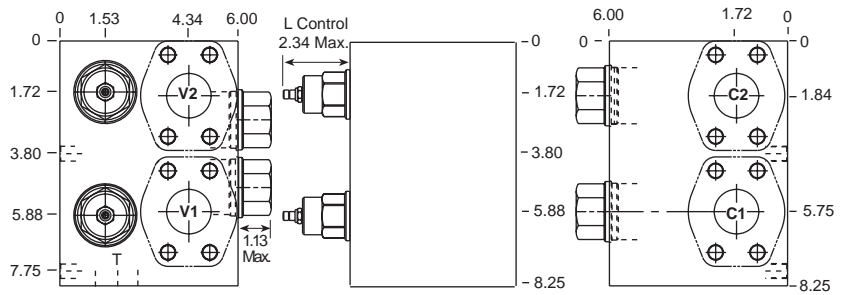
Ports C1, C2 V1, V2	Port T	Assembly Model Code*
1" NPTF	1 1/4" NPTF	<b>CBG*-L*N-HPE</b>
1 1/4" NPTF	1 1/4" NPTF	<b>CBG*-L*N-HPF</b>
SAE-16	SAE-20	<b>CBG*-L*N-HPM</b>
SAE-20	SAE-20	<b>CBG*-L*N-HPN</b>

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**0-60 GPM Cavity T-17A**



**0-120 GPM Cavity T-19A**



Model Code	Pilot Ratio
YCJE-L*N-AR	3:1
YCJE-L*N-GR	4.5:1
YCJE-L*N-HR	10:1

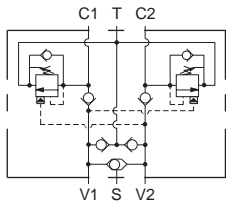
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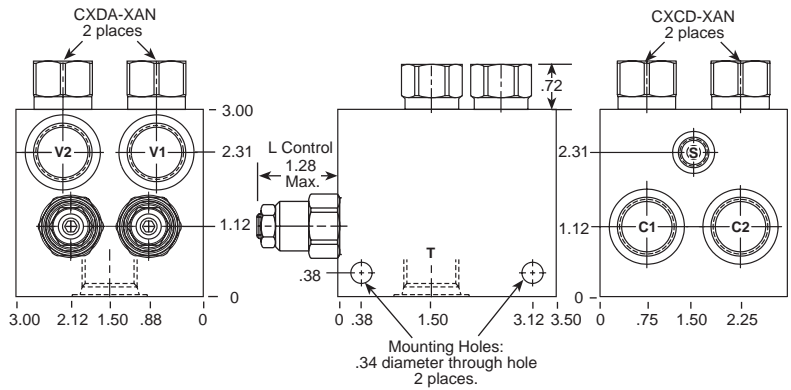
**DUAL LOAD CONTROL APPLICATIONS  
(TWO CAVITY WITH ANTI-CAVITATION CHECKS AND SHUTTLE)**

**PILOT RATIOS**  
1.5:1, 2:1, 2.3:1, 3:1, 4.5:1, 10:1

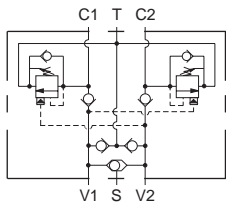


Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
3/8" NPTF	1/2" NPTF	1/4" NPTF	<b>CBC*-L*N-EQB</b>
1/2" NPTF	1/2" NPTF	1/4" NPTF	<b>CBC*-L*N-EQC</b>
SAE-8	SAE-10	SAE-4	<b>CBC*-L*N-EQJ</b>
SAE-10	SAE-10	SAE-4	<b>CBC*-L*N-EQK</b>

**0-15 GPM Cavity T-11A**

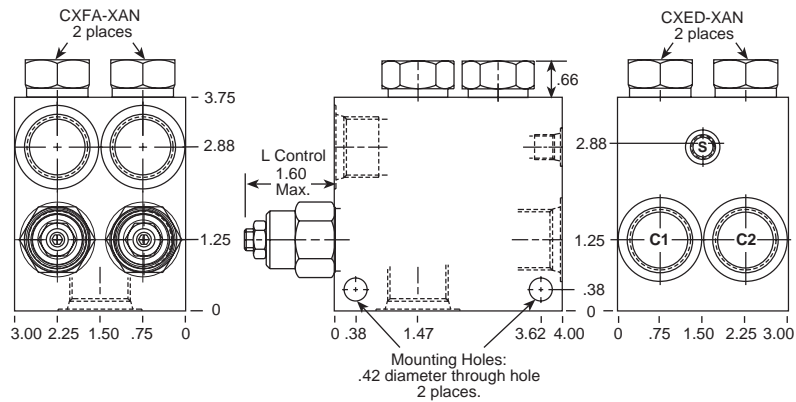


\*Add modifier /S to order Ductile Iron for pressure rating over 3000 psi.



Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
1/2" NPTF	3/4" NPTF	1/4" NPTF	<b>CBE*-L*N-BQC</b>
3/4" NPTF	3/4" NPTF	1/4" NPTF	<b>CBE*-L*N-BQD</b>
SAE-10	SAE-12	SAE-4	<b>CBE*-L*N-BQK</b>
SAE-12	SAE-12	SAE-4	<b>CBE*-L*N-BQL</b>

**0-30 GPM Cavity T-2A**



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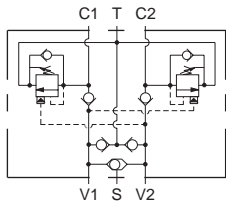
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## Standard Assemblies: Cushion Lock Valves

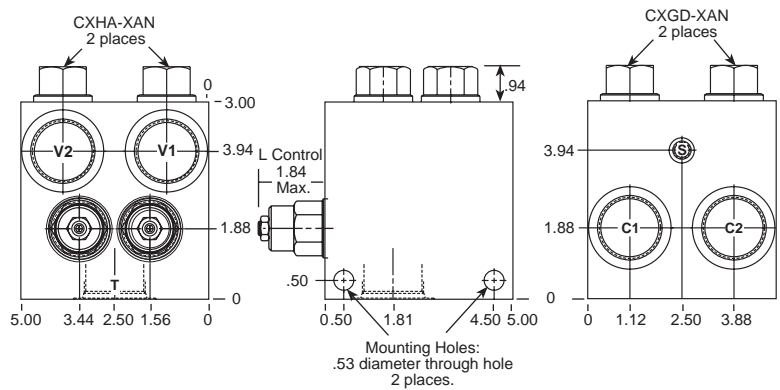
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**PILOT RATIOS**  
1.5:1, 2:1, 2.3:1, 3:1, 4.5:1, 10:1



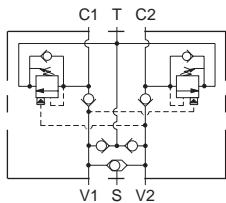
Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
1" NPTF	1 1/4" NPTF	1/4" NPTF	<b>CBG*-L*N-HQE</b>
1 1/4" NPTF	1 1/4" NPTF	1/4" NPTF	<b>CBG*-L*N-HQF</b>
SAE-16	SAE-20	SAE-4	<b>CBG*-L*N-HQM</b>
SAE-20	SAE-20	SAE-4	<b>CBG*-L*N-HQN</b>

### 0-60 GPM Cavity T-17A

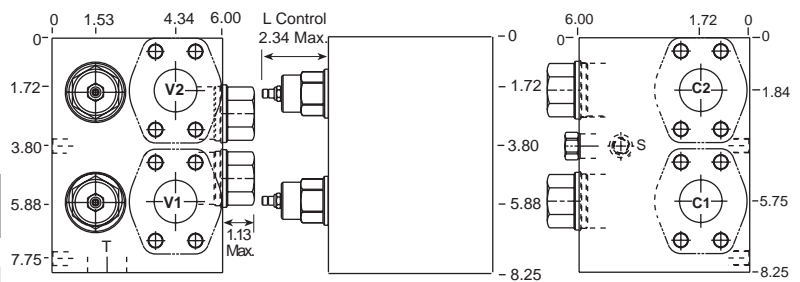


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### 0-120 GPM Cavity T-19A



Ports C1, C2 V1, V2	Port T	Port S	Assembly Model Code*
1 1/2" SAE C61	1 3/8" NPTF	1/4" NPTF	<b>YCJG-L*N-AR</b>
1 1/2" SAE C61	1 3/8" NPTF	1/4" NPTF	<b>YCJG-L*N-GR</b>
1 1/2" SAE C61	1 3/8" NPTF	SAE-4	<b>YCJG-L*N-HR</b>



Model Code	Pilot Ratio
YCJG-L*N-AR	3:1
YCJG-L*N-GR	4.5:1
YCJG-L*N-HR	10:1

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