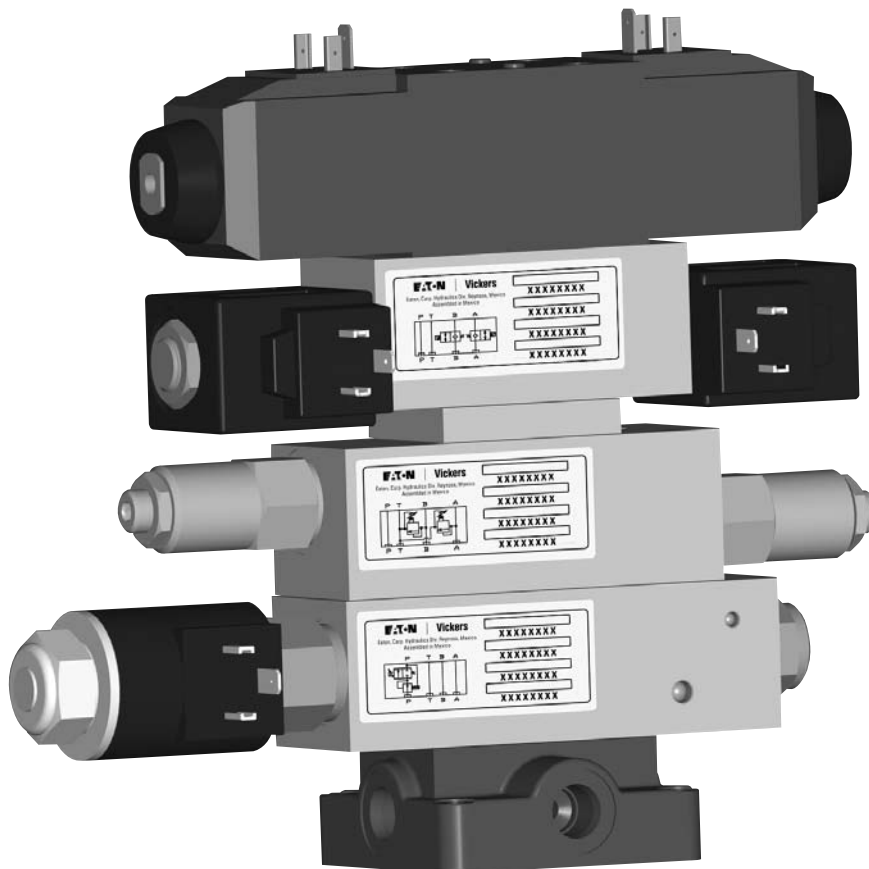




# Vickers

## Sandwich Valves

CETOP03 (NG6) Sandwich valve bodies and assemblies for applications up to 210 bar (3000 psi)



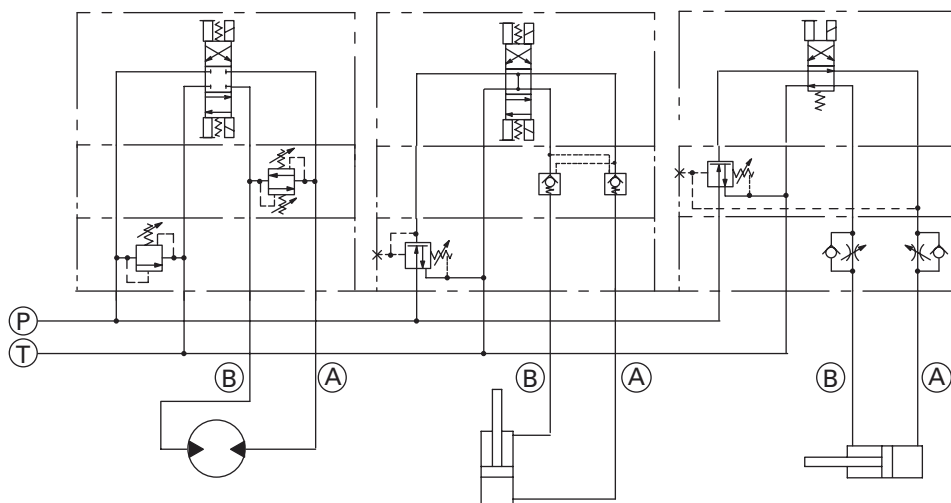
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Sandwich Valve  
Systems

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## Typical Sandwich Valve System



### WARNING

Aluminum housing is only to be used for pressures up to 210 bar (3000 psi).



### WARNING

Application of these products beyond published performance specifications may cause valve malfunction which may result in personal injury and/or damage to the machine.

# Sandwich Valves

Build a Compact, Cost effective, Reliable Hydraulic System with Vickers aluminum Sandwich Valves and SICV valves

## Reduces System Space Requirements

Sandwich valves make compact hydraulic systems in which specific function valves are "sandwich" mounted between a directional valve and a standard mounting surface.

## Reduce Cost

Sandwich valves eliminate inter valve piping and leak-prone tube and pipe connections. Installed cost is less than when using conventional valves.

## Versatile and Easy to Install

Sandwich valves have all the internal passages necessary to serve the directional valve topping them. Mounting surfaces and port patterns are to international standards: any valve conforming to ISO 4401 size 03; ANSI/B93.7M size D03; NFPA-D03; CETOP 3; and DIN 24340, NG6 mounting interface can be used with these Sandwich valves.

Linking and blanking plates are available to facilitate a variety of circuit designs and flexibility in applying these valves.

## Rugged and Reliable

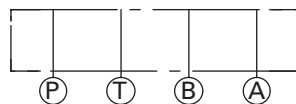
Cartridges are produced from hardened steel and mounted in aluminum housings. Excellent reliability is ensured. Cartridges are accessible without removing valves from an assembled stack. The housings are assembled in a kit

containing a locating pin for error free installation, all necessary plugs and standard Viton seals.

## Sandwich Systems... Easy to Understand, Easy to Design

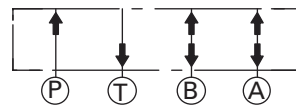
Sandwich circuitry is best shown using slightly different symbols than those for traditional valve configurations. Each Sandwich symbol has the same basic form and size as shown in figure 1.

Figure 1



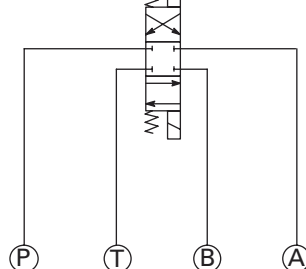
For ease of understanding, remember the directions of flow for each line, and that all four flow paths pass through each valve (see figure 2).

Figure 2



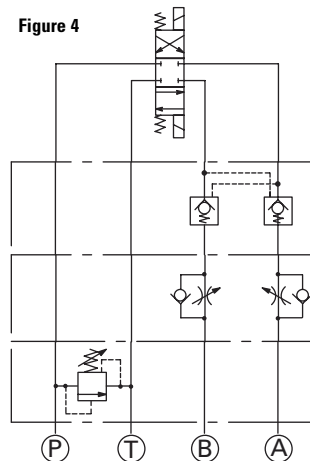
For clarity, directional valves are drawn vertically in Sandwich circuit diagrams (see figure 3).

Figure 3



Each station (valve stack) is a combination of functions. When designing and assembling Sandwich valves, care must be taken to ensure that they interact as required by stacking the functions in the correct sequence (figure 4 is an example).

Figure 4



Relief valves should normally be positioned next to the mounting surface (i.e. at the bottom of the stack). When both a flow control and a pilot operated check valve are required, it is recommended that the flow control valve be between the check valve and the actuator to prevent check valve chatter.

A combination of directional valve, sandwich valve(s) and subplate/manifold block completes the assembly.

## Sandwich Valve Assemblies

Aluminum sandwich valve assemblies consist of a housing kit, and one or more cartridges. They can be purchased complete by specifying a sandwich

model code or built by mixing an appropriate housing kit with cartridges to attain a desired function.

A housing kit contains a housing, locating pin, all necessary plugs and standard Viton seals.

## Sandwich Valve Locators

Sandwich valve locators group products by function and provides an easy way to identify a specific sandwich valve in the catalog.

It presents a sandwich valve functional symbol, function description and basic model code. Since every sandwich is put together by inserting cartridges into a housing kit, the locator provides concise information for easy selection of the components to build a specific function.

The following information is shown in the locator for every function: Housing kit model, part number, catalog page with the detailed information for the housing kit, model code and the catalog number for the cartridges & cartridge cavity.

## Housing Kits Data Page

Housing kits data pages L-25 thru L-44 provide the dimensional data, typical cartridges and functional information.

# Sandwich Model code information

Easy to  
understand, easy to design

## Sandwich Valves Ordering Information

To order sandwich valve components, use the information in the sandwich valves locator pages L-6 thru L-19.

To order a sandwich valve complete for models with one cartridge:

- Select the model code from the sandwich valve locator. Note that the housing kit model code substitutes for the standard inline body code in the same model field.
- Go to the referenced cartridge valve literature to complete the balance of the sandwich model code.

To order a sandwich valve complete for models with two cartridges:

- Select the model code from the sandwich valves locator.
- Go to the referenced page for the model code description.

## Sandwich Valve Model Codes

In order to speed the release of new products to customers, the sandwich valve product line has been configured with a fixed length model code. A fixed length model code simplifies the ordering process for our customers and facilitates the automated production release of new

valves and settings. In general, we have followed the standard model code for the base valve with the following three exceptions:

1. Seals: When specifying Buna-N seals, an N should be used in the model code for sandwich valves. (In the standard valve model code Buna-N seals are specified by leaving this column blank.)
2. Pressure settings: To avoid confusion on pressure settings, the setting should always be specified and not left blank. In addition, the confusing decimal system has been eliminated for sandwich valves. In the sandwich valve model code, simply specify the entire pressure setting in PSI using four digits for relief valves and 3 digits for check valves. Include leading zeros if necessary. For example:

### Relief and Counterbalance Valves

500 psi – 0500  
50 psi – 0050  
1525 psi – 1525

### Check Valves

210 psi – 210  
20 psi - 020  
3 psi - 003

3. Flow settings: To avoid confusion, the setting should always be specified and not left blank. In the sandwich valve model codes, all flow settings are specified in tenths of a GPM without decimal points. (include

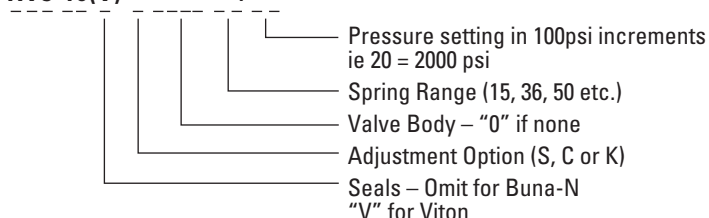
trailing zeroes and leading zeros if where required.) For example:

1 gpm – 010  
1.2 gpm – 012  
15 gpm - 150

Two examples are shown below:

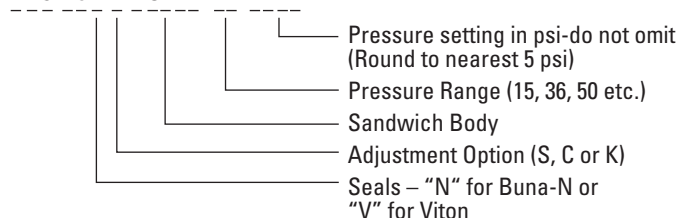
### Base valve model code

**RV5-10(V)-\*-\*\*\*\*\*-\*\*/\*\***



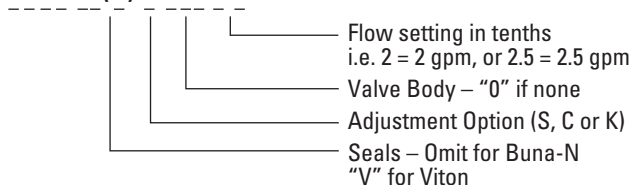
### Sandwich valve model code

**RV5-10\*\*\*-A321P-\*\*/\*\*\*\***



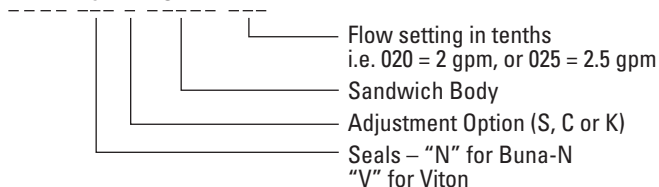
### Base valve model code

**FAR1-10(V)-\*-\*\*\*\*\*-\*,\***



### Sandwich valve model code (relieving from P to T)

**FAR1-10\*\*\*-A324A-\*\*\***



# Spare Parts

For Sandwich Valve Assemblies

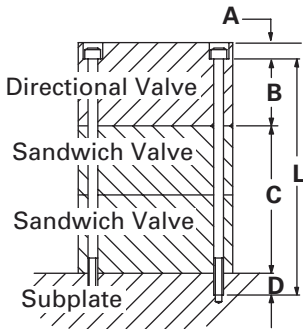
## Accessory Plates & Stud Rods

### Accessory Plates

Linking and blanking plates are available to facilitate a variety of circuit designs and flexibility in applying these valves. All accessory plates come with Viton O-Rings.

### Stud Rods

To simplify the installation of the sandwich valves, stud rod & nuts kits can be ordered and cut to length in the field. Once the rods are installed, they act as a guide when assembling the sandwich valves stack. After assembling the directional control valve on top of the stack, special nuts are used to retain the stack. Eaton offers 178 mm (7 in) or 305 mm (12 in) bolt kits (one bolt kit for these Sandwich valves comprises 4 bolts). To determine your needs, use the following guide for bolt length calculation.



- A** Amount of thread required for the stud nut 10,2 (0.40)
- B** Bolt clamp length in directional valve, blanking plate etc.
- C** Height of intermediate valve stack, comprising Vickers Sandwich valve(s) plus tapping plates etc.
- D** Depth of thread engagement in sub-plate/ manifold block. Minimum amount of thread required 10,2 mm (0.40 in.)
- L** Required bolt length; select from the table

### Note

1. Bolts should be torqued to 4.5-6.0 Nm (40-53 in. lbs) with threads lubricated.
2. If not using Eaton bolt kits, bolts must be to Grade 12.9 (ISO 898) or better.

### STUD ROD & NUT KIT\*

Metric: M5-0.8thd		Inch: 10-24	
Length (mm)	Kit number	Length (in)	Kit number
178	02-184934	7	02-184932
305	02-184935	12	02-184933

•Kit contains four stud rods and four stud nuts

### Spare Parts

Stud rod and nut kits are listed above. Individual nuts are also available:

NUTS		SEAL KITS	
Length (Thd)	Kit number	Seal material	Seal Kit number
10-24	02-184940	Buna N	02-184951
M5-0.8	02-184941	Viton	02-185282

### Filtration Requirements

For products in this catalog the recommendation fluid cleanliness levels is:  
Up to 210 bar (3000 psi)  
18/16/13

### Temperature Limits

Ambient range:  
-40° C to +120° C  
(-40° F to +248° F)


### Ordering Procedure

Specify requirements by housing kit, or valve model code, and by seal kit number.

# Pressure Control Functions

Sandwich Valves Locator  
ISO 4401-03/CETOP  
03 series

Function		Functional Symbol				Model Code			
		P	T	B	A				
Relief valve P-T						RV1 10 * * A321P **/**** 00		Hsg kit: model Part No.	A321P 02 185342
								Cartridge Cartridge Data Sheet Cavity	RV1-10 Section E C-10-2
Relief valve A-T						RV1 10 * * A321A **/**** 00		Hsg kit: model Part No.	A321A 02-185340
								Cartridge Cartridge Data Sheet Cavity	RV1-10 Section E C-10-2
Relief valve B-T						RV1 10 * * A321B **/**** 00		Hsg kit: model Part No.	A321B 02-185341
								Cartridge Cartridge Data Sheet Cavity	RV1-10 Section E C-10-2
Proportional relief valve P-T						ERV1 10 * *** A321P **** 00		Hsg kit: model Part No.	A321P 02-185342
								Cartridge Cartridge Data Sheet Cavity	ERV1-10 Section E C-10-2
Proportional relief valve A-T						ERV1 10 * *** A321A **** 00		Hsg kit: model Part No.	A321A 02-185340
								Cartridge Cartridge Data Sheet Cavity	ERV1-10 Section E C-10-2
Proportional relief valve B-T						ERV1 10 * *** A321B **** 00		Hsg kit: model Part No.	A321B 02-185341
								Cartridge Cartridge Data Sheet Cavity	ERV1-10 Section E C-10-2
Relief valve P-T						RV5 10 * * A321P **/**** 00		Hsg kit: model Part No.	A321P 02-185342
								Cartridge Cartridge Data Sheet Cavity	RV5-10 Section E C-10-2
Relief valve A-T						RV5 10 * * A321A **/**** 00		Hsg kit: model Part No.	A321A 02-185340
								Cartridge Cartridge Data Sheet Cavity	RV5-10 Section E C-10-2
Relief valve B-T						RV5 10 * * A321B **/**** 00		Hsg kit: model Part No.	A321B 02-185341
								Cartridge Cartridge Data Sheet Cavity	RV5-10 Section E C-10-2
		P	T	B	A				



CAUTION  
Sandwich valve flow ratings are limited by the ratings  
of individual cartridge. Consult cartridge valve literature.



#### CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Pressure Control Functions

Function	Functional Symbol	Model Code		
	<div><div>P</div><div>T</div><div>B</div><div>A</div></div>			
Solenoid Controlled Relief valve P-T Normally Open		SRV 10 * 0 S A322P 35/ *** **  Refer to page L-20 for model code breakdown	Hsg kit: model Part No. A322P 02-185344  Cartridge Cartridge Data Sheet Cavity SV5-8-0/RV1-10 Section A/E C-8-2/C-10-2	
Solenoid Controlled Relief valve P-T Normally Closed		SRV 10 * C S A322P 35/ *** **  Refer to page L-20 for model code breakdown	Hsg kit: model Part No. A322P 02-185344  Cartridge Cartridge Data Sheet Cavity SV5-8-C/RV1-10 Section A/E C-8-2/C-10-2	
Dual Relief valve A-T, B-T		RV1 8 * * A311W A**/****B**/**** 00  Refer to page L-21 for model code breakdown	Hsg kit: model Part No. A311W 02-185364  Cartridge Cartridge Data Sheet Cavity RV1-8 qty 2 Section E C-8-2 qty 2	
Dual Relief valve A-T, B-T		RV1 10 * * A312W A**/****B**/**** 00  Refer to page L-20 for model code breakdown	Hsg kit: model Part No. A312W 02-185365  Cartridge Cartridge Data Sheet Cavity RV1-10 qty 2 Section E C-10-2 qty 2	
Dual Relief valve A-T, B-T		RV5 10 * * A312W A**/****B**/**** 00  Refer to page L-20 for model code breakdown	Hsg kit: model Part No. A312W 02-185365  Cartridge Cartridge Data Sheet Cavity RV5-10 qty 2 Section E C-10-2 qty 2	
Cross port relief valve A-B		RV3A 10 * * A321W A**/****B**/**** 00  Refer to page L-20 for model code breakdown	Hsg kit: model Part No. A321W 02-185343  Cartridge Cartridge Data Sheet Cavity RV3A-10 qty 2 Section E C-10-2 qty 2	
Cross port relief valve A-B		RV5A 10 * * A321W A**/****B**/**** 00  Refer to page L-20 for model code breakdown	Hsg kit: model Part No. A321W 02-185343  Cartridge Cartridge Data Sheet Cavity RV5A-10 qty 2 Section E C-10-2 qty 2	
Sequence valve In to P		PSV7 10 * * A316P **/**** 00  Refer to page L-21 for model code breakdown	Hsg kit: model Part No. A316P 02-185374  Cartridge Cartridge Data Sheet Cavity PSV7-10 Section E C-10-3	
Sequence valve In to A Reverse FF Check		PSV7 10 * * A316A **/**** 00  Refer to page L-21 for model code breakdown	Hsg kit: model Part No. A316A 02-185372  Cartridge Cartridge Data Sheet Cavity PSV7-10/CV3-10 Section E/G C-10-3/C-10-2	
	<div><div>P</div><div>T</div><div>B</div><div>A</div></div>			

CAUTION  
Sandwich valve flow ratings are limited by the ratings



## CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Pressure Control Functions

Function	Functional Symbol	Model Code		
Sequence Valve Out of A Reverse FF Check		<b>PSV7 10 * * A319A **/**** 00</b>  Refer to page L-21 for model code breakdown	Hsg kit: model Part No.	<b>A319A</b> 02-185377
Sequence Valve In to B Reverse FF Check		<b>PSV7 10 * * A316B **/**** 00</b>  Refer to page L-21 for model code breakdown	Hsg kit: model Part No.	<b>A316B</b> 02-185373
Sequence Valve Out of B Reverse FF Check		<b>PSV7 10 * * A319B **/**** 00</b>  Refer to page L-21 for model code breakdown	Hsg kit: model Part No.	<b>A319B</b> 02-185378
Reducing Valve on (P) Drained to T		<b>PRV2 10 * * A326P **/**** 00</b>  Refer to page L-21 for model code breakdown	Hsg kit: model Part No.	<b>A326P</b> 02-185353
Reducing on A Drained to T Reverse FF Check		<b>PRV2 10 * * A310A **/**** 00</b>  Refer to page L-21 for model code breakdown	Hsg kit: model Part No.	<b>A310A</b> 02-185362
Reducing on B Drained to T Reverse FF Check		<b>PRV2 10 * * A310B **/**** 00</b>  Refer to page L-21 for model code breakdown	Hsg kit: model Part No.	<b>A3210B</b> 02-185363
Pressure Compensator Restrictive on P w/Shuttle sense from A & B		<b>PCR 10 * A309P *** 00</b>  Refer to page L-22 for model code breakdown	Hsg kit: model Part No.	<b>A309P</b> 02-185381
Pressure Compensator Bypass to T w/Shuttle sense from A & B		<b>PCB 10 * A319P *** 00</b>  Refer to page L-22 for model code breakdown	Hsg kit: model Part No.	<b>A319P</b> 02-185382

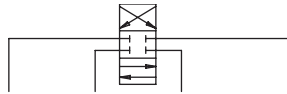


## CAUTION

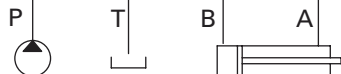
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.



# Check & Pilot Check Functions



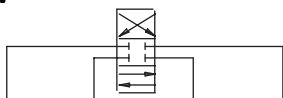
Function	Functional Symbol	Model Code		
Pilot Operated Check Valve On A Pilot from B		POC1 10 * * A323A *** 00	Hsg kit: model Part No.	A323A 02-185345
			Cartridge Cartridge Data Sheet Cavity	POC1-10 Section G C-10-3S
Pilot Operated Check Valve On B Pilot from A		POC1 10 * * A323B *** 00	Hsg kit: model Part No.	A323B 02-185346
			Cartridge Cartridge Data Sheet Cavity	POC1-10 Section G C-10-3S
Pilot Operated Check Valve On A & B Cross Piloted		POC1 10 * * A323W *** 00	Hsg kit: model Part No.	A323W 02-185347
			Cartridge Cartridge Data Sheet Cavity	POC1-10qty 2 Section G C-10-3S qty 2
Check Valve On P		CV3 8 * P A307P *** 00	Hsg kit: model Part No.	A307P 02-185356
			Cartridge Cartridge Data Sheet Cavity	CV3-8 Section G C-8-2
Check Valve On P		CV3 10 * P A324P *** 00	Hsg kit: model Part No.	A324P 02-185350
			Cartridge Cartridge Data Sheet Cavity	CV3-10 Section G C-10-2
Check Valve On T		CV3 8 * P A307T *** 00	Hsg kit: model Part No.	A307T 02-185357
			Cartridge Cartridge Data Sheet Cavity	CV3-8 Section G C-8-2
Check Valve On T		CV3 10 * P A308T *** 00	Hsg kit: model Part No.	A308T 02-185360
			Cartridge Cartridge Data Sheet Cavity	CV3-10 Section G C-10-2
Check Valve On A Free Flow Out		CV3 8 * P A307A *** 00	Hsg kit: model Part No.	A307A 02-185354
			Cartridge Cartridge Data Sheet Cavity	CV3-8 Section G C-8-2
Check Valve On A Free Flow Out		CV3 10 * P A314A *** 00	Hsg kit: model Part No.	A314A 02-185367
			Cartridge Cartridge Data Sheet Cavity	CV3-10 Section G C-10-2



## CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Check and Flow Control Functions



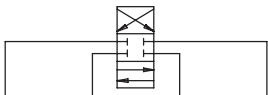
Function	Functional Symbol	Model Code		
Check Valve On B Free Flow Out		CV3 8 * P A307B *** 00	Hsg kit: model Part No.	A307B 02-185355
Check Valve On B Free Flow Out		CV3 10 * P A314B *** 00	Hsg kit: model Part No.	A314B 02-185368
Check Valve On T to A & B		CV3 8 * P A320T *** 00	Hsg kit: model Part No.	A320T 02-185379
Check Valve On T to A & B		CV3 10 * P A317T *** 00	Hsg kit: model Part No.	A317T 02-185375
Anti-Cavitation Check P-T		CV16 10 * P A321P *** 00	Hsg kit: model Part No.	A321P 02-185342
Shuttle Valve A & B Output External		DSV2 8 * B A309W 00	Hsg kit: model Part No.	A309W 02-185361
Flow Control Meter in P		NV1 10 * * A324P 00	Hsg kit: model Part No.	A324P 02-185350
Flow Control & Check Meter in A		FCV7 10 * * A324A FF 00	Hsg kit: model Part No.	A324A 02-185348
Flow Control & Check Meter Out A		FCV7 10 * * A314A FF 00	Hsg kit: model Part No.	A314A 02-185367
Flow Control & Check Meter in B		FCV 7 10 * * A324B FF 00	Hsg kit: model Part No.	A324B 02-185349



## CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Flow Control Functions



Function	Functional Symbol	Model Code		
Flow Control & Check Meter Out B		FCV7 10 * * A314B FF 00	Hsg kit: model Part No.	A314B 02-185368
Flow Control & Check Meter In A & B		FCV7 10 * * A324W FF 00 Refer to page L-22 for model code breakdown	Hsg kit: model Part No.	A324W 02-185351
Flow Control & Check Meter Out A & B		FCV7 10 * * A314W FF 00 Refer to page L-22 for model code breakdown	Hsg kit: model Part No.	A314W 02-185369
Flow Regulator Pressure Compensated Meter In P		FAR1 10 * * A324P *** 00	Hsg kit: model Part No.	A324P 02-185350
Flow Regulator Pressure Compensated and Check Meter In A		FAR1 10 * * A324A *** 00	Hsg kit: model Part No.	A324A 02-185348
Flow Regulator Pressure Compensated and Check Meter Out A		FAR1 10 * * A314A *** 00	Hsg kit: model Part No.	A314A 02-185367
Flow Regulator Pressure Compensated and Check Meter In B		FAR1 10 * * A324B *** 00	Hsg kit: model Part No.	A324B 02-185349
Flow Regulator Pressure Compensated and Check Meter Out B		FAR1 10 * * A314B *** 00	Hsg kit: model Part No.	A314B 02-185368
Flow Regulator Pressure Compensated and Check Meter In, A & B		FAR1 10 * * A324W A***B*** 00	Hsg kit: model Part No.	A324W 02-185351



CAUTION  
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

L

# Flow Control & Solenoid Control Functions

Function	Functional Symbol	Model Code		
Flow Regulator Pressure Compensated and Check Meter Out, A & B		FAR1 10 * * A314W A***B*** 00	Hsg kit: model Part No.	A314W 02-185369
			Cartridge Cartridge Data Sheet Cavity	FAR1-10 qty 2 Section F C-10-2 qty 2
Proportional Flow Control Pressure Compensated On P		EPV 10 * * A313P *** * * 00  Refer to page L-23 for model code breakdown	Hsg kit: model Part No.	A313P 02-185366
			Cartridge Cartridge Data Sheet Cavity	EPV-10, DPS2-10 I & B C-10-2/C-10-3S
Solenoid 2 Way Poppet Type (P-T), N/C		SV1 10 * C A325P *** * 00	Hsg kit: model Part No.	A325P 02-185352
			Cartridge Cartridge Data Sheet Cavity	SV1-10-C Section A C-10-2
Solenoid 2 Way Poppet Type (P-T), N/O		SV5 10 * O A325P *** * 00	Hsg kit: model Part No.	A325P 02-185352
			Cartridge Cartridge Data Sheet Cavity	SV5-10-O Section A C-10-2
Solenoid 2 Way Poppet Type (P-T), N/C		SV3 10 * C A325P *** * 00	Hsg kit: model Part No.	A325P 02-185352
			Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2
Solenoid 2 Way Poppet Type (P-T), N/O		SV3 10 * O A325P *** * 00	Hsg kit: model Part No.	A325P 02-185352
			Cartridge Cartridge Data Sheet Cavity	SV3-10-O Section A C-10-2
Solenoid 2 Way Spool Type (P-T), N/C		SV4 10 * C A325P *** * 00	Hsg kit: model Part No.	A325P 02-185352
			Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
Solenoid 2 Way Spool Type (P-T), N/O		SV4 10 * O A325P *** * 00	Hsg kit: model Part No.	A325P 02-185352
			Cartridge Cartridge Data Sheet Cavity	SV4-10-O Section A C-10-2
Solenoid 2 Way Poppet Type Blocked on A Normally Closed		SV3 10 * C A324A *** * 00	Hsg kit: model Part No.	A324A 02-185348
			Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2



## CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Solenoid Control Functions

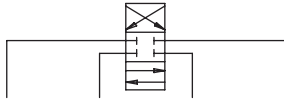
Function	Functional Symbol				Model Code		
	P	T	B	A			
Poppet Type Blocked on A Normally Open					SV3 10 * O A324A **** 00	Hsg kit: model Part No.	A324A 02-185348
						Cartridge Cartridge Data Sheet Cavity	SV3-10-O Section A C-10-2
Spool Type Blocked on A Normally Closed					SV4 10 * C A324A **** 00	Hsg kit: model Part No.	A324A 02-185348
						Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
Spool Type Blocked on A Normally Open					SV4 10 * O A324A **** 00	Hsg kit: model Part No.	A324A 02-185348
						Cartridge Cartridge Data Sheet Cavity	SV4-10-O Section A C-10-2
Poppet Type Blocked on B Normally Closed					SV3 10 * C A324B **** 00	Hsg kit: model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SVC3-10-C Section A C-10-2
Poppet Type Blocked on B Normally Open					SV3 10 * O A324B **** 00	Hsg kit: model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2
Spool Type Blocked on B Normally Closed					SV4 10 * C A324B **** 00	Hsg kit: model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
Spool Type Blocked on B Normally Open					SV4 10 * O A324B **** 00	Hsg kit: model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SV4-10-O Section A C-10-2
Poppet Type Blocked on A & B Normally Closed					SV3 10 * C A324W **** 00	Hsg kit: model Part No.	A324W 02-185351
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C qty 2 Section A C-10-2 qty 2
Poppet Type Blocked on A & B Normally Open					SV3 10 * O A324W **** 00	Hsg kit: model Part No.	A324W 02-185351
						Cartridge Cartridge Data Sheet Cavity	SV3-10-O qty 2 Section A C-10-2 qty 2
	P	T	B	A			



CAUTION  
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

L

# Solenoid Control Functions



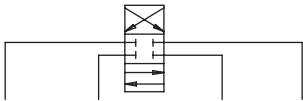
Function	Functional Symbol				Model Code		
	P	T	B	A			
Spool Type Blocked on A & B Normally Closed					SV4 10 * C A324W *** 00	Hsg kit: model Part No.	A324W 02-185351
						Cartridge Cartridge Data Sheet Cavity	SV4-10-C qty 2 Section A C-10-2 qty 2
Spool Type Blocked on A & B Normally Open					SV4 10 * O A324W *** 00	Hsg kit: model Part No.	A324W 02-185351
						Cartridge Cartridge Data Sheet Cavity	SV4-10-O qty 2 Section A C-10-2 qty 2
Poppet Type Load Holding on A Normally Closed					SV3 10 * C A314A *** 00	Hsg kit: model Part No.	A314A 02-185367
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2
Poppet Type Load Holding on A Normally Open					SV3 10 * O A314A *** 00	Hsg kit: model Part No.	A314A 02-185367
						Cartridge Cartridge Data Sheet Cavity	SV3-10-O Section A C-10-2
Poppet Type Load Holding on B Normally Closed					SV3 10 * C A314B *** 00	Hsg kit: model Part No.	A314B 02-185368
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2
Poppet Type Load Holding on B Normally Open					SV3 10 * O A314B *** 00	Hsg kit: model Part No.	A314B 02-185368
						Cartridge Cartridge Data Sheet Cavity	SV3-10-O Section A C-10-2
Poppet Type Load Holding on A & B Normally Closed					SV3 10 * C A314W *** 00	Hsg kit: model Part No.	A314W 02-185369
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C qty 2 Section A C-10-2 qty 2
Poppet Type Load Holding on A & B Normally Open					SV3 10 * O A314W *** 00	Hsg kit: model Part No.	A314W 02-185369
						Cartridge Cartridge Data Sheet Cavity	SV3-10-O qty 2 Section A C-10-2 qty 2
	P	T	B	A			



## CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Solenoid Control Functions



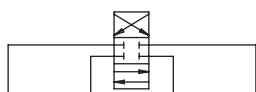
Function	Functional Symbol				Model Code		
	P	T	B	A			
Poppet Type Bi-Directional Load Holding on A Normally Closed					SBV11 10 * C A314A *** 00	Hsg kit: model Part No.	A314A 02-185367
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-C Section A C-10-2
Poppet Type Bi-Directional Load Holding on A Normally Open					SBV11 10 * O A314A *** 00	Hsg kit: model Part No.	A314A 02-185367
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-O Section A C-10-2
Poppet Type Bi-Directional Load Holding on B Normally Closed					SBV11 10 * C A314B *** 00	Hsg kit: model Part No.	A314B 02-185368
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-C Section A C-10-2
Poppet Type Bi-Directional Load Holding on B Normally Open					SBV11 10 * O A314B *** 00	Hsg kit: model Part No.	A314B 02-185368
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-O Section A C-10-2
Poppet Type Bi-Directional Load Holding on A & B Normally Closed					SBV11 10 * C A314W *** 00	Hsg kit: model Part No.	A314W 02-185369
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-C qty 2 Section A C-10-2 qty 2
Poppet Type Bi-Directional Load Holding on A & B Normally Open					SBV11 10 * O A314W *** 00	Hsg kit: model Part No.	A314W 02-185369
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-O qty 2 Section A C-10-2 qty 2
Poppet Type Unload A - T Normally Closed					SV1 10 * C A315A *** 00	Hsg kit: model Part No.	A315A 02-185370
						Cartridge Cartridge Data Sheet Cavity	SV1-10-C Section A C-10-2
Poppet Type Unload A - T Normally Open					SV5 10 * O A315A *** 00	Hsg kit: model Part No.	A315A 02-185370
						Cartridge Cartridge Data Sheet Cavity	SV5-10-C Section A C-10-2
	P	T	B	A			



CAUTION  
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

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# Solenoid Control Functions



Function	Functional Symbol	Model Code		
	P T B A			
Poppet Type Unload A - T Normally Closed		SV3 10 * C A315A *** 00	Hsg kit: model Part No.	A315A 02-185370
			Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2
Poppet Type Unload A - T Normally Open		SV3 10 * O A315A *** 00	Hsg kit: model Part No.	A315A 02-185370
			Cartridge Cartridge Data Sheet Cavity	SV3-10-O Section A C-10-2
Spool Type Unload A - T Normally Closed		SV4 10 * C A315A *** 00	Hsg kit: model Part No.	A315A 02-185370
			Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
Spool Type Unload A - T Normally Open		SV4 10 * O A315A *** 00	Hsg kit: model Part No.	A315A 02-185370
			Cartridge Cartridge Data Sheet Cavity	SV4-10-O Section A C-10-2
Poppet Type Unload B - T Normally Closed		SV1 10 * C A315B *** 00	Hsg kit: model Part No.	A315B 02-185371
			Cartridge Cartridge Data Sheet Cavity	SV1-10-C Section A C-10-2
Poppet Type Unload B - T Normally Open		SV5 10 * O A315B *** 00	Hsg kit: model Part No.	A315B 02-185371
			Cartridge Cartridge Data Sheet Cavity	SV5-10-O Section A C-10-2
Poppet Type Unload B - T Normally Closed		SV3 10 * C A315B *** 00	Hsg kit: model Part No.	A315B 02-185371
			Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2
Poppet Type Unload B - T Normally Open		SV3 10 * O A315B *** 00	Hsg kit: model Part No.	A315B 02-185371
			Cartridge Cartridge Data Sheet Cavity	SV3-10-O Section A C-10-2
Poppet Type Unload B - T Normally Closed		SV4 10 * C A315B *** 00	Hsg kit: model Part No.	A315B 02-185371
			Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
	P T B A			



## CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.



# Solenoid Control Functions

Function	Functional Symbol				Model Code		
	P	T	B	A			
2 Way Spool Type Unload B - T Normally Open					SV4 10 * 0 A315B **** 00	Hsg kit: model Part No.	A315B 02-185371
						Cartridge Cartridge Data Sheet Cavity	SV4-10-0 Section A C-10-2
2 Way Poppet Type Unload A & B - T Normally Closed					SV1 10 * C A317T **** 00	Hsg kit: model Part No.	A317T 02-185375
						Cartridge Cartridge Data Sheet Cavity	SV1-10-C qty 2 Section A C-10-2 qty 2
2 Way Poppet Type Unload A & B - T Normally Open					SV5 10 * 0 A317T **** 00	Hsg kit: model Part No.	A317T 02-185375
						Cartridge Cartridge Data Sheet Cavity	SV5-10-0 qty 2 Section A C-10-2 qty 2
2 Way Poppet Type Unload A & B - T Normally Closed					SV3 10 * C A317T **** 00	Hsg kit: model Part No.	A317T 02-185375
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C qty 2 Section A C-10-2 qty 2
2 Way Poppet Type Unload A & B - T Normally Open					SV3 10 * 0 A317T **** 00	Hsg kit: model Part No.	A317T 02-185375
						Cartridge Cartridge Data Sheet Cavity	SV3-10-0 qty 2 Section A C-10-2 qty 2
2 Way Spool Type Unload A & B - T Normally Closed					SV4 10 * C A317T **** 00	Hsg kit: model Part No.	A317T 02-185375
						Cartridge Cartridge Data Sheet Cavity	SV4-10-C qty 2 Section A C-10-2 qty 2
2 Way Spool Type Unload A & B - T Normally Open					SV4 10 * 0 A317T **** 00	Hsg kit: model Part No.	A317T 02-185375
						Cartridge Cartridge Data Sheet Cavity	SV4-10-0 qty 2 Section A C-10-2 qty 2
Poppet Type Bi-Directional Blocked A - B & B - A Normally Closed					SBV11 10 * C A318W **** 00	Hsg kit: model Part No.	A318W 02-185376
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-C Section A C-10-2
Poppet Type Bi-Directional Blocked A - B & B - A Normally Open					SBV11 10 * C0 A318W **** 00	Hsg kit: model Part No.	A318W 02-185376
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-0 Section A C-10-2
	P	T	B	A			



CAUTION  
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

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# Solenoid Control & Load Control Functions

Function	Functional Symbol	Model Code		
	P T B A			
Solenoid Valve Spool Type Blocked A to B & B to A Normally Closed		SV4 10 * C A318W *** 00	Hsg kit: model Part No.	A318W 02-185376
			Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
Solenoid Valve Spool Type Blocked A to B & B to A Normally Open		SV4 10 * O A318W *** 00	Hsg kit: model Part No.	A318W 02-185376
			Cartridge Cartridge Data Sheet Cavity	SV4-10-O Section A C-10-2
Solenoid 3-Way Selector on P		SV1 10 * 3 A326P *** 00	Hsg kit: model Part No.	A326P 02-185353
			Cartridge Cartridge Data Sheet Cavity	SV1-10-3 Section A C-10-3
Solenoid 3-Way Selector on P		SV4 10 * 3 A326P *** 00	Hsg kit: model Part No.	A326P 02-185353
			Cartridge Cartridge Data Sheet Cavity	SV4-10-3 Section A C-10-3
Manual Rotary Selector on P		MRV3 10 * K A236P 00	Hsg kit: model Part No.	A326P 02 185353
			Cartridge Cartridge Data Sheet Cavity	MRV3-10-K-0 Section A C-10-3

## Load Control Functions

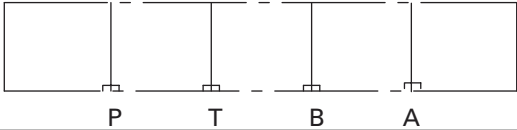
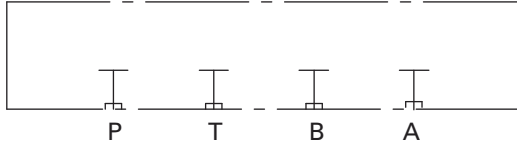
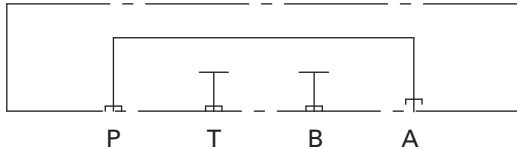
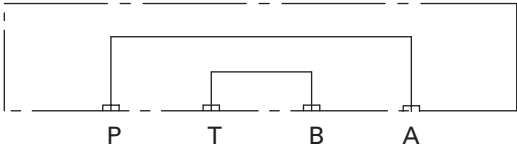
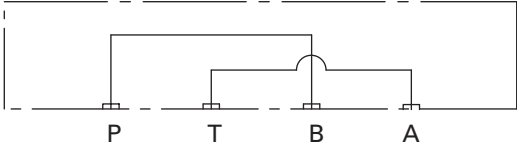
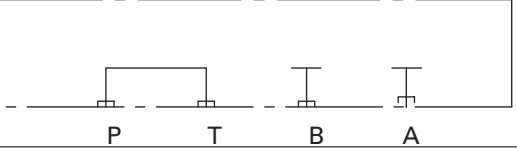
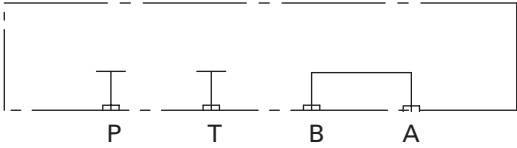
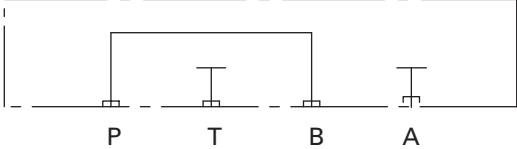
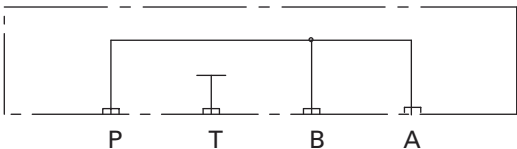
Counterbalance Valve On A Pilot from B		CBV* 10 * * A323A * 30/**** 00	Hsg kit: model Part No.	A323A 02-185345
			Cartridge Cartridge Data Sheet Cavity	CBV*-10 Section H C-10-3S
Counterbalance Valve On B Pilot from A		CBV* 10 * * A323B * 30/**** 00	Hsg kit: model Part No.	A323B 02-185346
			Cartridge Cartridge Data Sheet Cavity	CBV*-10 Section H C-10-3S
Counterbalance Valve On A & B Cross Piloted		CBV* 10 * * A323WA* 30/**** B * 30/**** 00  Refer to page L-23 for model code breakdown	Hsg kit: model Part No.	A323W 02-185347
			Cartridge Cartridge Data Sheet Cavity	CBV*-10 qty 2 Section H C-10-3S qty 2



### CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Spacer / Blanking / Linking Plates

Function	Functional Symbol	Part Number
Spacer Plate 10 mm (.39) thick		02-185273 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Blanking Plate		02-185274 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Linking Plate P to A with B & T Blocked		02-185275 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Linking Plate P to A & B to T		02-185276 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Linking Plate P to B & A to T		02-185277 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Linking Plate P to A with A & B Blocked		02-185278 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Linking Plate P to A with P & T Blocked		02-185279 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Linking Plate P to B with A & T Blocked		02-185280 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282
Linking Plate P to A & B with T Blocked		02-185281 Note: O-Rings to be ordered separately See page Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02185282

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## CAUTION

Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

# Model Codes

For Sandwich valve assemblies with two valves

<div> <div>SRV</div> <div>10</div> <div>*</div> <div>*</div> <div>*</div> <div>A322P</div> <div>** /****</div> <div>****</div> <div>*</div> <div>**</div> </div>										
<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>										
<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> </div>										
<b>1 Function</b> <b>SRV</b> – Solenoid actuated relief valve			<b>4 Style</b> <b>C</b> – Normally closed <b>O</b> – Normally open			<b>6 Housing Kit</b> <b>A322P</b> – Solenoid Relief Valve			<b>9 Voltage Range</b> <b>12D</b> – 24 VDC <b>24D</b> – 24 VDC <b>115A</b> – 115 VAC <b>230A</b> – 230 VAC	
<b>2 Size</b> <b>10</b> – 10 Size			<b>5 Adjustment</b> <b>C</b> – Cap <b>F</b> – Fixed <b>I</b> – Internal <b>K</b> – Knob <b>S</b> – Screw			<b>7 Cracking Pressure Range</b> <b>03</b> -3,5-20 bar (50-300 psi) <b>35</b> -17-240 bar (250-3500 psi)			<b>10 Connector Type</b> <b>G</b> – ISO 4401 DIN 43650 <b>P</b> – 1/2"NPT conduit <b>W</b> – Leadwire	
<b>3 Seals</b> <b>N</b> – Buna-N <b>V</b> – Viton This Assembly includes an SV5-8 solenoid valve and an RV5-10 relief valve						<b>8 Pressure Setting</b> User requested setting in psi			<b>11 Special Features</b> <b>00</b> – None	

<div> <div>RV5A</div> <div>10</div> <div>*</div> <div>*</div> <div>*****</div> <div>A</div> <div>** /****</div> <div>B</div> <div>** /****</div> <div>**</div> </div>											
<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>											
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<b>1 Function</b> <b>RV5</b> – Relief valve			<b>4 Adjustment</b> <b>C</b> – Cap <b>F</b> – Fixed <b>I</b> – Internal <b>K</b> – Knob <b>S</b> – Screw			<b>6 A Port Acted Upon</b>			<b>9 B Port Acted Upon</b>		
<b>2 Size</b> <b>10</b> – 10 Size						<b>7 Cracking Pressure Range</b> <b>03</b> – 3,5-20 bar (50-300 psi) <b>20</b> – 7-140 bar (100-2000 psi) <b>35</b> – 17-240 bar (50-3500 psi)			<b>10 Cracking Pressure Range</b> <b>03</b> – 3,5-20 bar (50-300 psi) <b>20</b> – 7-140 bar (100-2000 psi) <b>35</b> – 17-240 bar (50-3500 psi)		
<b>3 Seals</b> <b>N</b> – Buna-N <b>V</b> – Viton			<b>5 Housing Kit</b> <b>A312W</b> – Dual A & B to T relief <b>A321W</b> – Cross port relief			<b>8 Pressure Setting</b> User requested setting in psi			<b>11 Pressure Setting</b> User requested setting in psi		
									<b>12 Special Features</b> <b>00</b> – None		

<div> <div>RV3A</div> <div>10</div> <div>*</div> <div>*</div> <div>*****</div> <div>A</div> <div>** /****</div> <div>B</div> <div>** /****</div> <div>**</div> </div>											
<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>											
<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> </div>											
<b>1 Function</b> <b>RV1</b> – Relief valve			<b>4 Adjustment</b> <b>C</b> – Cap <b>F</b> – Fixed <b>K</b> – Knob <b>S</b> – Screw			<b>6 A Port Acted Upon</b>			<b>9 B Port Acted Upon</b>		
<b>2 Size</b> <b>10</b> – 10 Size						<b>7 Cracking Pressure Range</b> <b>03</b> -3,5-20 bar (50-300 psi) <b>09</b> -7-62 bar (100-900 psi) <b>18</b> -7-124 bar (250-1800 psi) <b>36</b> -35-250 bar (500-3600 psi)			<b>10 Cracking Pressure</b> <b>03</b> -3,5-20 bar (50-300 psi) <b>09</b> -7-62 bar (100-900 psi) <b>18</b> -7-124 bar (250-1800 psi) <b>36</b> -35-250 bar (500-3600 psi)		
<b>3 Seals</b> <b>N</b> – Buna-N <b>V</b> – Viton			<b>5 Housing Kit</b> <b>A312W</b> – Dual A & B to T relief <b>A321W</b> – Cross port relief			<b>8 Pressure Setting</b> User requested setting in psi			<b>11 Pressure Setting</b> User requested setting in psi		
									<b>12 Special Features</b> <b>00</b> – None		

# Model Codes

For Sandwich valve assemblies with two valves

<div><div>RV1</div><div>8</div><div>*</div><div>*</div><div>A311W</div><div>A</div><div>**/****</div><div>B</div><div>**/****</div><div>**</div></div>											
<div><div><div>1</div></div><div><div>2</div></div><div><div>3</div></div><div><div>4</div></div><div><div>5</div></div><div><div>6</div></div><div><div>7</div></div><div><div>8</div></div><div><div>9</div></div><div><div>10</div></div><div><div>11</div></div><div><div>12</div></div></div>											
<div><div>1</div><div>Function</div><div>RV1 – Relief valve</div></div>				<div><div>4</div><div>Adjustment</div><div>C – Cap</div><div>K – Knob</div><div>S – Screw</div></div>				<div><div>7</div><div>Cracking Pressure Range</div><div>03 -3, 5-20 bar (50-300 psi)</div><div>20 -41- 140 bar (100-900 psi)</div><div>36 -20-250 bar (300-3600 psi)</div></div>			
<div><div>2</div><div>Size</div><div>8 – 8 Size</div></div>				<div><div>5</div><div>Housing Kit</div></div>				<div><div>8</div><div>Pressure Setting</div><div>Specify in psi</div></div>			
<div><div>3</div><div>Seals</div><div>N – Buna-N</div><div>V – Viton</div></div>				<div><div>6</div><div>A Port Acted Upon</div></div>				<div><div>9</div><div>B Port Acted Upon</div></div>			
								<div><div>10</div><div>Cracking Pressure</div><div>03 -3, 5-20 bar (50-300 psi)</div><div>20 -41- 140 bar (100-900 psi)</div><div>36 -20-250 bar (300-3600 psi)</div></div>			
								<div><div>11</div><div>Pressure Setting</div><div>Specify in psi</div></div>			
								<div><div>12</div><div>Special Features</div><div>00 – None</div></div>			

<div><div>PSV7</div><div>10</div><div>*</div><div>*</div><div>****</div><div>**/**</div><div>****</div></div>							
<div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div>							
<div><div><div>1</div></div><div><div>2</div></div><div><div>3</div></div><div><div>4</div></div><div><div>5</div></div><div><div>6</div></div><div><div>7</div></div><div><div>8</div></div></div>							
<div><div>1</div><div>Function</div><div>PSV2 – Pressure sequence valve</div></div>		<div><div>4</div><div>Adjustment</div><div>C – Cap</div><div>F – Fixed</div><div>I – Internal</div><div>K – Knob</div><div>S – Screw</div></div>		<div><div>6</div><div>Cracking Pressure</div><div>02 - 3,5-10 bar (50-150 psi)</div><div>03 - 5-20 bar (75-300 psi)</div><div>05 - 7-30 bar (100-450 psi)</div><div>10 - 14-65 bar (200-950 psi)</div><div>18 - 20-125 bar (300-1800 psi)</div></div>		<div><div>7</div><div>Pressure Setting</div><div>User requested setting in psi</div><div>Note</div><div>The other cartridge used in this assembly is a CV3-10-P-020</div></div>	
<div><div>2</div><div>Size</div><div>10 – 10 Size</div></div>		<div><div>5</div><div>Housing Kit</div></div>				<div><div>8</div><div>Special Features</div><div>00 – None</div></div>	
<div><div>3</div><div>Seals</div><div>N – Buna-N</div><div>V – Viton</div></div>							

<div><div>PRV2</div><div>10</div><div>*</div><div>*</div><div>****</div><div>**/****</div><div>**</div></div>							
<div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>							
<div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div></div></div>							
<div><div>1</div><div>Function</div><div>PRV2 – Pressure reducing valve</div></div>		<div><div>3</div><div>Seals</div><div>N – Buna-N</div><div>V – Viton</div></div>		<div><div>5</div><div>Housing Kit</div></div>		<div><div>7</div><div>Pressure Setting</div><div>User requested setting in psi</div></div>	
<div><div>2</div><div>Size</div><div>10 – 10 Size</div></div>		<div><div>4</div><div>Adjustment</div><div>C – Cap</div><div>F – Fixed</div><div>I – Internal</div><div>K – Knob</div><div>S – Screw</div></div>		<div><div>6</div><div>Cracking Pressure</div><div>03 -3,5-20 bar (50-300 psi)</div><div>20 - 7-140 bar (100-2000 psi)</div><div>35 - 17-240 bar (250-3500 psi)</div></div>		<div><div>8</div><div>Special Features</div><div>00 – None</div></div>	

L

# Model Codes

For Sandwich valve assemblies with two valves

<div><div>PCB10*A319P*****</div><div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div></div></div>						
<div><div>1</div><div>Function</div><div>PCB – Pressure compensator, bypass</div></div>	<div><div>4</div><div>Housing Kit</div></div>	<div><div>6</div><div>Special Features</div><div>00 – None</div></div>	<div>Note</div> <div>The operating back pressure at port 3 (at A &amp; B) must never be less than 1.3 times the spring set pressure</div> <div>The other cartridge used in the assembly is a DSV2-8-B-0</div>			
<div><div>2</div><div>Size</div><div>10 – 10 Size</div></div>	<div><div>5</div><div>Differential Pressure</div><div>(of DPS2-10-P-F cartridge)</div><div>005 – 0,3 bar (5 psi)</div><div>010 – 0, 7 bar (10 psi)</div><div>020 – 1, 38 bar (20 psi)</div><div>040 – 2, 75 bar (40 psi)</div><div>080 – 5, 5 bar (80 psi)</div><div>160 – 11,0 bar (160 psi)</div></div>					
<div><div>3</div><div>Seals</div><div>N – Buna-N</div><div>V – Viton</div></div>						
<div><div>PCR10*A309P*****</div><div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div></div></div>						
<div><div>1</div><div>Function</div><div>PCR – Pressure compensator, restrictive</div></div>	<div><div>4</div><div>Housing Kit</div></div>	<div><div>6</div><div>Special Features</div><div>00 – None</div></div>	<div>Note</div> <div>The operating back pressure at port 3 (at A &amp; B) must never be less than 1.3 times the spring set pressure</div> <div>The other cartridge used in the assembly is a DSV2-8-B-0</div>			
<div><div>2</div><div>Size</div><div>10 – 10 Size</div></div>	<div><div>5</div><div>Differential Pressure</div><div>(of DPS2-10-F-F cartridge)</div><div>005 – 0,3 bar (5 psi)</div><div>010 – 0,7 bar (10 psi)</div><div>020 – 1,38 bar (20 psi)</div><div>040 – 2,75 bar (40 psi)</div><div>080 – 5,5 bar (80 psi)</div><div>160 – 11,0 bar (160 psi)</div></div>					
<div><div>3</div><div>Seals</div><div>N – Buna-N</div><div>V – Viton</div></div>						
<div><div>FCV710* * *****FF**</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div></div></div>						
<div><div>1</div><div>Function</div><div>FCV7 – Flow control valve</div></div>	<div><div>3</div><div>Seals</div><div>N – Buna-N</div><div>V – Viton</div></div>	<div><div>5</div><div>Housing Kit</div><div>A314W – Meter out</div><div>A324W – Meter in</div></div>	<div><div>7</div><div>Special Features</div><div>00 – None</div></div>			
<div><div>2</div><div>Size</div><div>10 – 10 Size</div></div>	<div><div>4</div><div>Adjustment</div><div>C – Cap</div><div>F – Fixed</div><div>K – Knob</div><div>S – Screw</div></div>	<div><div>6</div><div>Control Flow Option</div><div>FF – Needle valve with free reverse flow</div></div>				

# Model Codes

For Sandwich valve assemblies with two valves

<div><div>FAR1</div><div>10</div><div>*</div><div>*</div><div>*****</div><div>A</div><div>***</div><div>B</div><div>***</div></div> <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div></div>								
<div>1</div> <div>Function</div> <div>FAR1 – Fully adjustable flow regulator</div>	<div>4</div> <div>Adjustment</div> <div>H – Calibrated handknob with locknut</div> <div>K – Handknob with locknut</div> <div>S – Screw with locknut</div>	<div>6</div> <div>A Port Acted Upon</div> <div>7</div> <div>Factory Set Flow Rate</div> <div>Specify in tenths of a gallon per minute. i.e. 025=2.5 USgpm</div>	<div>8</div> <div>B Port Acted Upon</div> <div>9</div> <div>Factory Set Flow Rate</div> <div>Specify in tenths of a gallon per minute. i.e. 025=2.5 USgpm</div>					
<div>2</div> <div>Size</div> <div>10 – 10 Size</div>	<div>3</div> <div>Seals</div> <div>N – Buna-N</div> <div>V – Viton</div>	<div>5</div> <div>Housing Kit</div> <div>A314W – Meter out</div> <div>A324W – Meter in</div>						

<div><div>EPV</div><div>10</div><div>*</div><div>A313P</div><div>***</div><div>(*)</div><div>*</div></div> <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div></div>						
<div>1</div> <div>Function</div> <div>EPV – Proportional flow control</div>	<div>4</div> <div>Housing Kit</div> <div>5</div> <div>Voltage Range</div> <div>12D – 24 VDC</div> <div>24D – 24 VDC</div> <div>6</div> <div>Manual Override Option</div> <div>Blank – No manual override</div> <div>M – Pin type</div> <div>S – Screw type</div>	<div>7</div> <div>Coil Connector Type</div> <div>F – Weatherpack</div> <div>Q – Spade terminals</div> <div>U – DIN 43650</div> <div>W – Leadwire</div> <div>Y – Metri-pak</div>	Note The other cartridge used in the assembly is a DPS2-10-F-F-0-160			
<div>2</div> <div>Size</div> <div>10 – 10 Size</div>	<div>3</div> <div>Seals</div> <div>N – Buna-N</div> <div>V – Viton</div>					

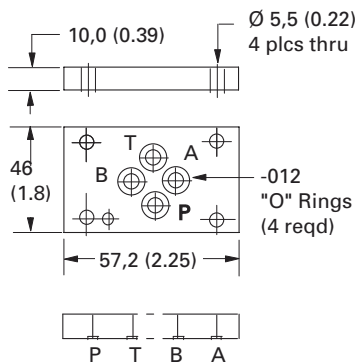
<div><div>CBV*</div><div>10</div><div>*</div><div>*</div><div>A323W</div><div>A</div><div>*</div><div>30 / *****</div><div>B</div><div>*</div><div>30 / *****</div><div>**</div></div> <div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div></div>													
<div>1</div> <div>Pilot Ratio/function</div> <div>CBV 1 – 4:1 CBV</div> <div>CBV 2 – 10:1 CBV</div>	<div>4</div> <div>Adjustment</div> <div>C – Cap over screw</div> <div>K – Handknob</div> <div>S – Screw with locknut</div>	<div>8</div> <div>Pressure Range</div> <div>30 – 62, 210 bar (900 – 3000 psi)</div>	<div>12</div> <div>Pressure Range</div> <div>30 – 62, 210 bar (900 – 3000 psi)</div>										
<div>2</div> <div>Size</div> <div>10 – 10 Size</div>	<div>5</div> <div>Housing Kit</div> <div>6</div> <div>A Port Acted Upon</div> <div>7</div> <div>Free Flow Crack Pressure Range</div> <div>A – 1,38 bar (20 psi) standard</div> <div>B – 0,28 bar (4 psi) anti-cavitation</div>	<div>9</div> <div>Pressure Setting</div> <div>Specify in psi</div> <div>10</div> <div>B Port Acted Upon</div> <div>11</div> <div>Free Flow Crack Pressure Range</div> <div>A – 1, 38 bar (20 psi) standard</div> <div>B – 0, 28 bar (4 psi) anti-cavitation</div>	<div>13</div> <div>Pressure Setting</div> <div>Specify in psi</div> <div>14</div> <div>Special Features</div> <div>00 – None</div>										
<div>3</div> <div>Seals</div> <div>N – Buna-N</div> <div>V – Viton</div>													

L

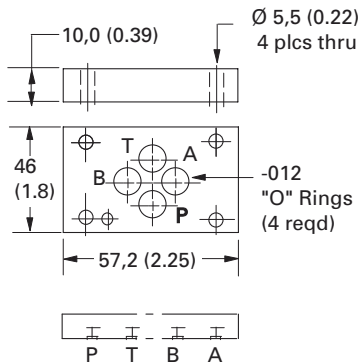
# Dimensions

Spacer, blanking & linking plates

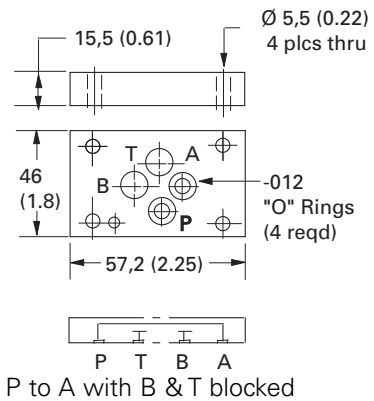
Spacer Plate 02-185273



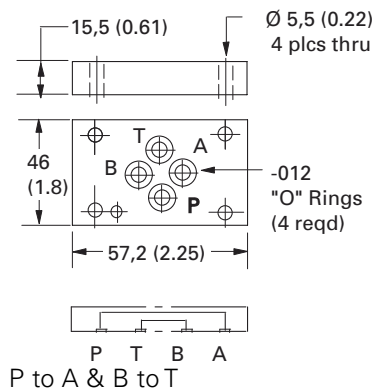
Blanking Plate 02-185274



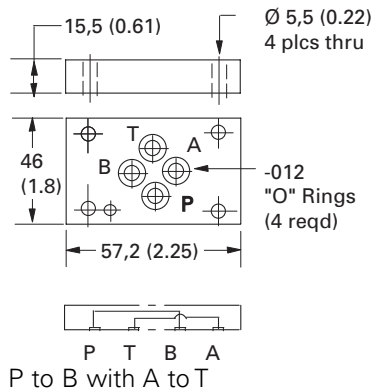
Linking Plate 02-185275



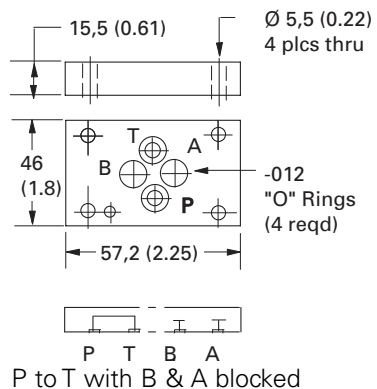
Linking Plate 02-185276



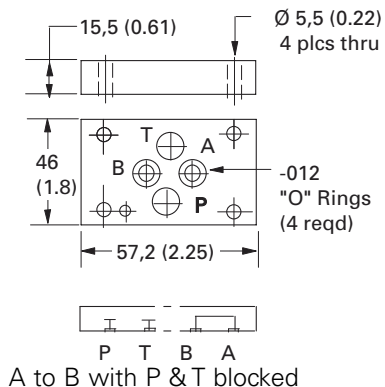
Linking Plate 02-185277



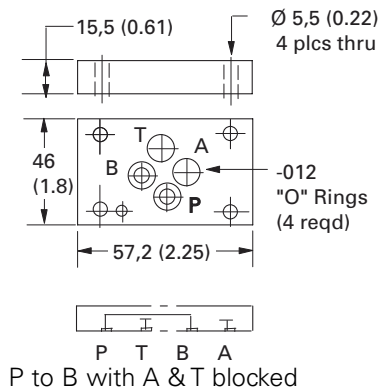
Linking Plate 02-185278



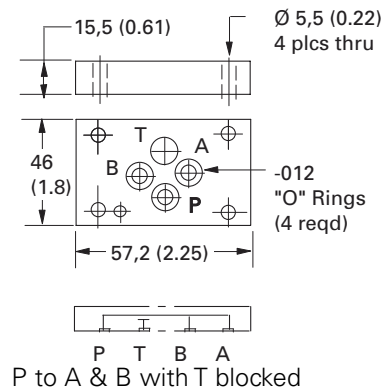
Linking Plate 02-185279



Linking Plate 02-185280



Linking Plate 02-185281





# Dimensions

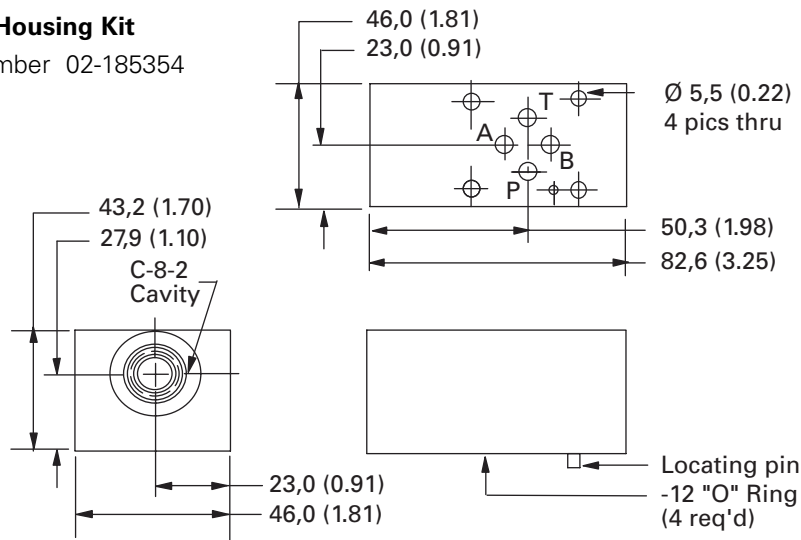
ISO 440103/CETOP3  
Housing Kits

## Dimensions

mm (inch)

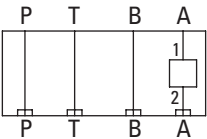
### A307A Housing Kit

Part Number 02-185354



TYPICAL CARTRIDGES	FUNCTION
CV3-8	Check valve on A, Free flow out

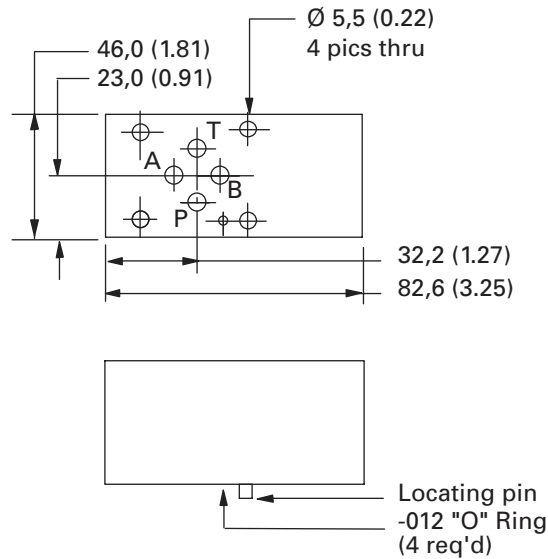
## Cavity Porting



Torque cartridge in housing  
34-40 Nm (25-30 ft. lbs)

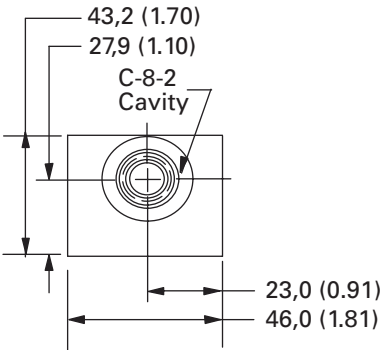
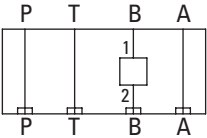
### A307B Housing Kit

Part Number 02-185355



TYPICAL CARTRIDGES	FUNCTION
CV3-8	Check valve on B, Free flow out

## Cavity Porting



Torque cartridge in housing  
34-40 Nm (25-30 ft. lbs)

# Dimensions

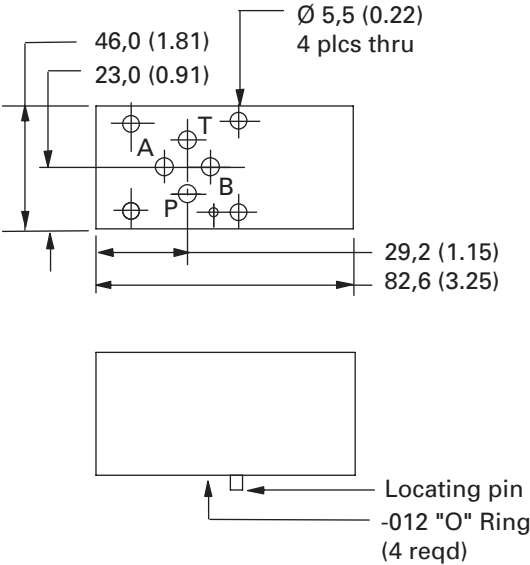
ISO 440103/CETOP3  
Housing Kits

## Dimensions

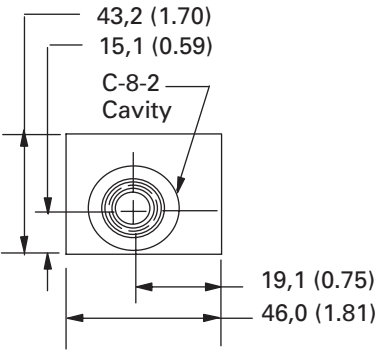
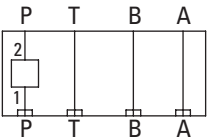
mm (inch)

### A307P Housing Kit

Part Number 02-185356



## Cavity Porting



Torque cartridge in housing  
34-40 Nm (25-30 ft. lbs)

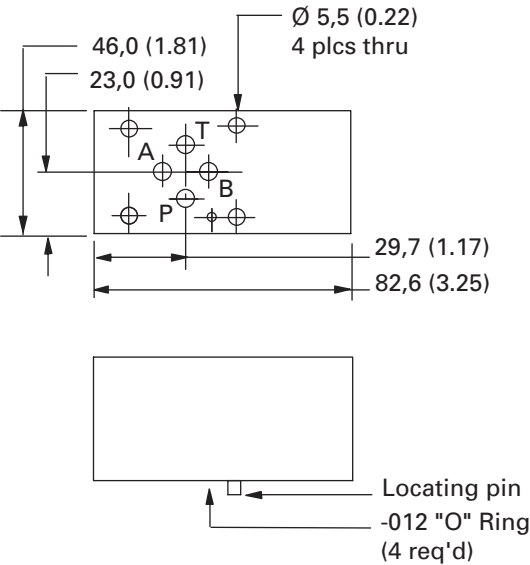
## TYPICAL CARTRIDGES

## FUNCTION

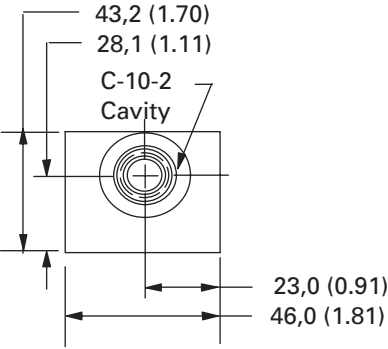
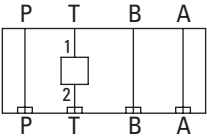
TYPICAL CARTRIDGES	FUNCTION
CV3-8	Check valve on P

### A308T Housing Kit

Part Number 02-185360



## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## TYPICAL CARTRIDGES

## FUNCTION

TYPICAL CARTRIDGES	FUNCTION
CV3-10	Check valve on T

# Dimensions

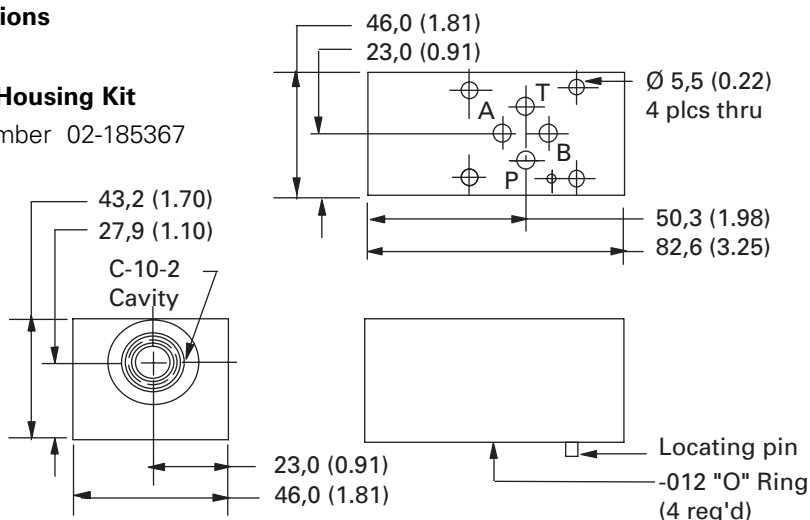
ISO 440103/CETOP3  
Housing Kits

## Dimensions

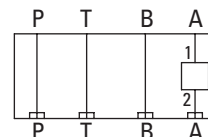
mm (inch)

### A314A Housing Kit

Part Number 02-185367



### Cavity Porting



### TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
CV3-10-P	Check valve on A, free flow out
FAR1-10	Flow regulator, pressure compensated and check, Meter out A
FCV7-10	Flow control and check, Meter out A
SBV11-10-C	Solenoid 2-way poppet type bi-directional load holding on A, normally closed
SBV11-10-O	Solenoid 2-way poppet type bi-directional load holding on A, normally open
SV3-10-C	Solenoid 2-way poppet type load holding on A, normally closed
SV3-10-O	Solenoid 2-way poppet type load holding on A, normally open

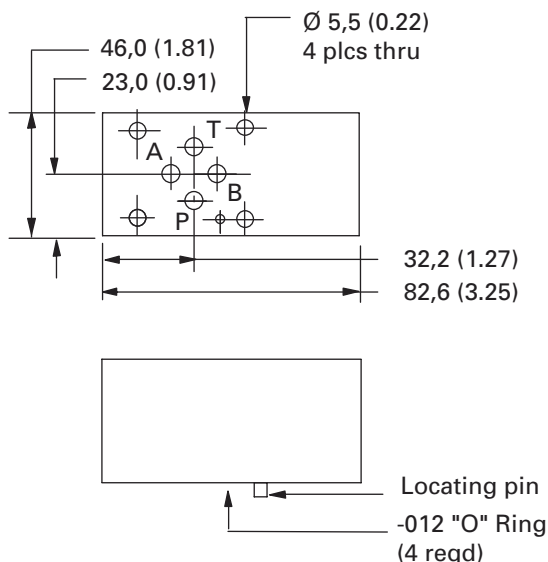
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

### Note

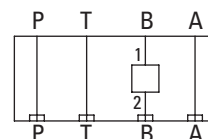
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

### A314B Housing Kit

Part Number 02-185368



### Cavity Porting



### TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
CV3-10 *-P	Check valve on B, free flow out
FAR1-10	Flow regulator, pressure compensated and check, Meter out B
FCV7-10	Flow control and check, Meter out B
SBV11-10-C	Solenoid 2-way poppet type bi-directional load holding on B, normally closed
SBV11-10-O	Solenoid 2-way poppet type bi-directional load holding on B, normally open
SV3-10-C	Solenoid 2-way poppet type load holding on B, normally closed
SV3-10-O	Solenoid 2-way poppet type load holding on B, normally open

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

### NOTE

This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

# Dimensions

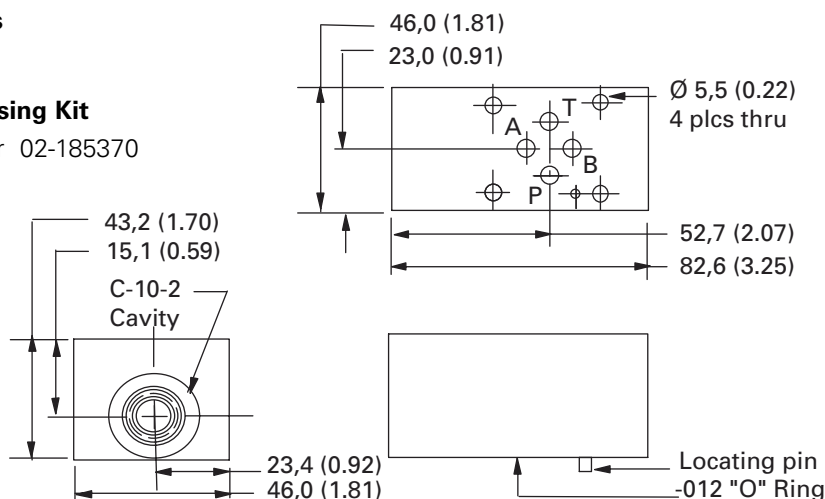
ISO 440103/CETOP3  
Housing Kits

## Dimensions

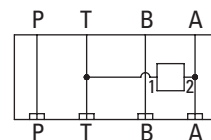
mm (inch)

### A315A Housing Kit

Part Number 02-185370



## Cavity Porting



## TYPICAL CARTRIDGES

## FUNCTION

SV1-10-C	Solenoid 2-way poppet type unload A-T normally closed
SV3-10-C	Solenoid 2-way poppet type unload A-T normally closed
SV3-10-O	Solenoid 2-way poppet type unload A-T normally open
SV4-10-C	Solenoid 2-way spool type unload A-T normally closed
SV4-10-O	Solenoid 2-way spool type unload A-T normally open
SV5-10-O	Solenoid 2-way poppet type unload A-T normally open

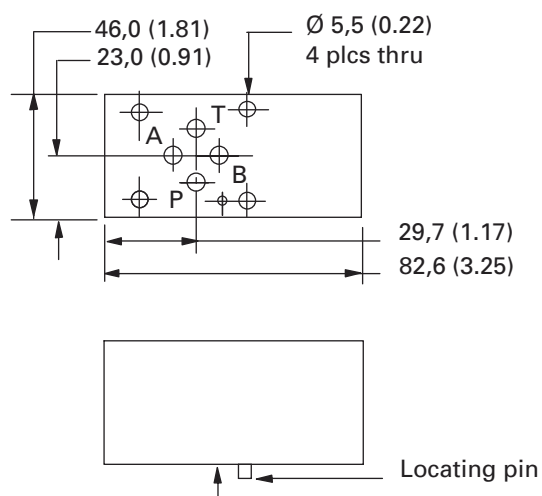
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

Note

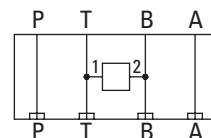
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

### A315B Housing Kit

Part Number 02-185371



## Cavity Porting



## TYPICAL CARTRIDGES

## FUNCTION

SV1-10-C	Solenoid 2-way poppet type unload B-T normally closed
SV3-10-C	Solenoid 2-way poppet type unload B-T normally closed
SV3-10-O	Solenoid 2-way poppet type unload B-T normally open
SV4-10-C	Solenoid 2-way spool type unload B-T normally closed
SV4-10-O	Solenoid 2-way spool type unload B-T normally open
SV5-10-O	Solenoid 2-way poppet type unload B-T normally open

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

Note

This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

# Dimensions

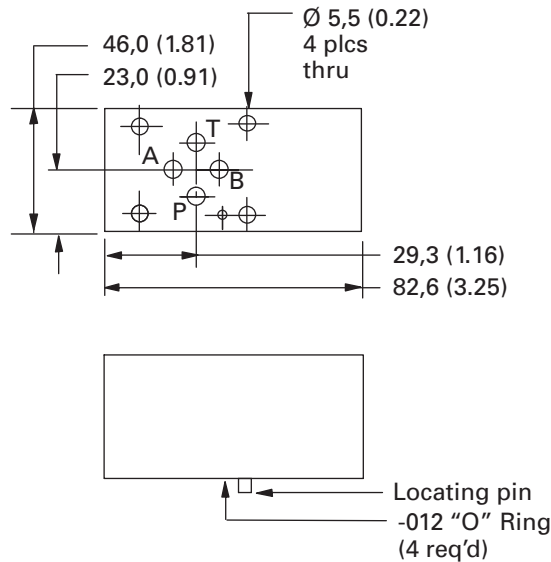
ISO 440103/CETOP3  
Housing Kits

## Dimensions

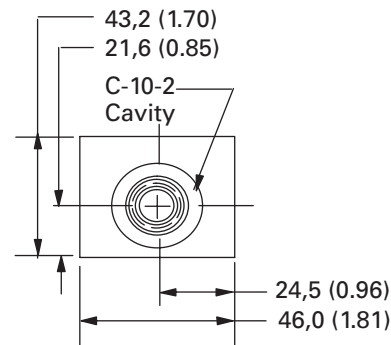
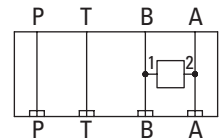
mm (inch)

### A318W Housing Kit

Part Number 02-185376



## Cavity Porting



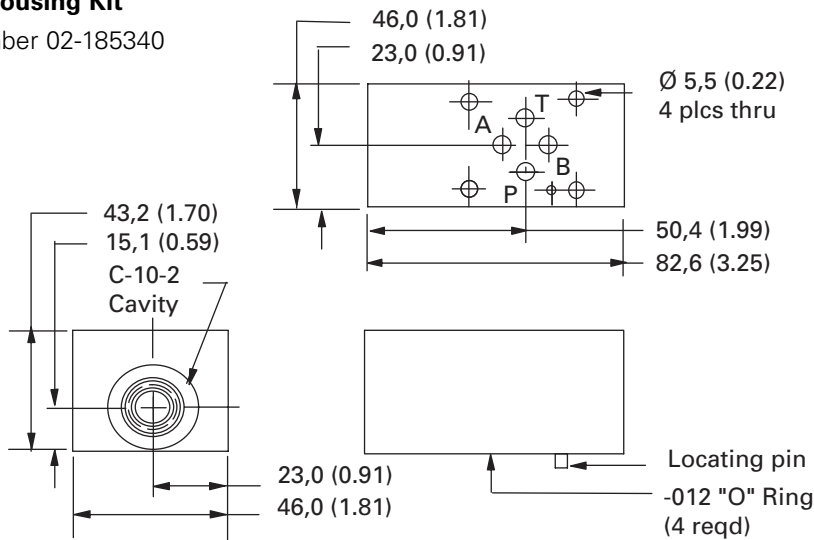
## TYPICAL CARTRIDGES FUNCTION

SV4-10-C	Solenoid 2-way spool type locking A-B & B-A normally closed
SV4-10-O	Solenoid 2-way spool type locking A-B & B-A normally open
SV11-10-C	Solenoid 2-way poppet type bi-directional locking A-B & B-A normally closed
SV11-10-O	Solenoid 2-way poppet type bi-directional locking A-B & B-A normally open

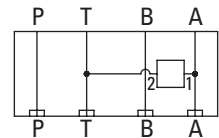
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

### A321A Housing Kit

Part Number 02-185340



## Cavity Porting



## TYPICAL CARTRIDGES FUNCTION

ERV1-10	Proportional relief valve A-T
RV1-10	Relief valve A-T
RV5-10	Relief valve A-T

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

Note  
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

# Dimensions

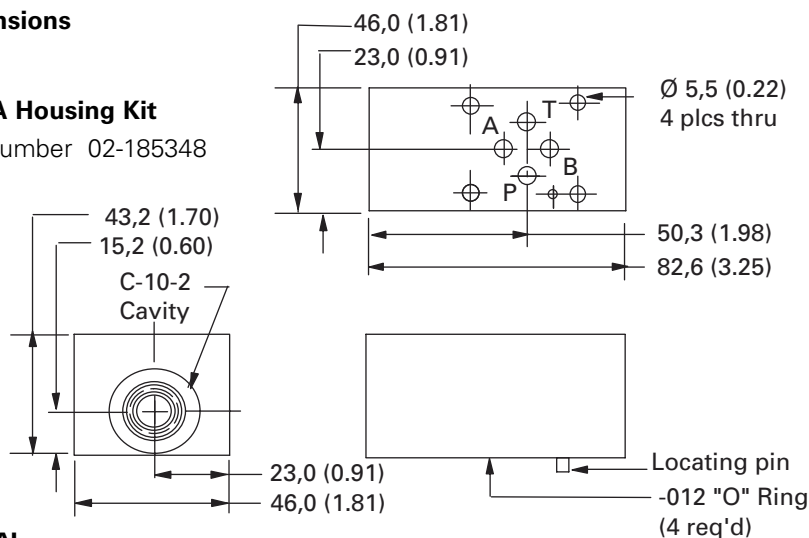
ISO 440103/CETOP3  
Housing Kits

## Dimensions

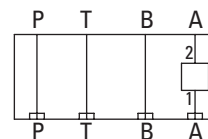
mm (inch)

### A324A Housing Kit

Part Number 02-185348



## Cavity Porting



## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
FAR1-10	Flow regulator pressure compensated and check, meter in A
FCV7-10	Flow control and check, meter in A
SV3-10-C	Solenoid 2-way poppet type blocking on A, normally closed
SV3-10-O	Solenoid 2-way poppet type blocking on A, normally open
SV4-10-C	Solenoid 2-way spool type blocking on A, normally closed
SV4-10-O	Solenoid 2-way spool type blocking on A, normally open

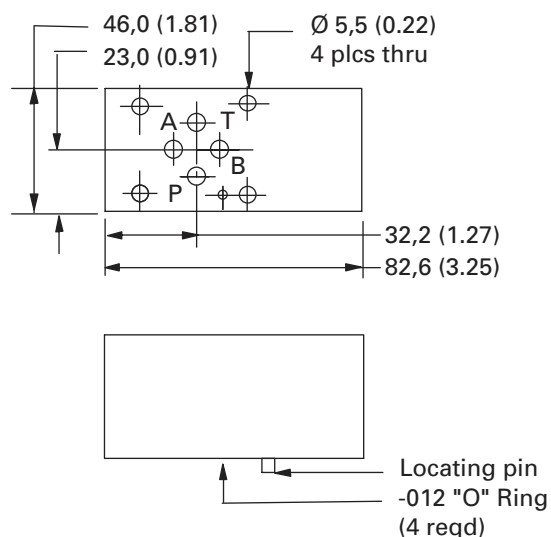
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## Note

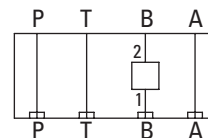
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

### A324B Housing Kit

Part Number 02-185349



## Cavity Porting



## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
FAR1-10	Flow regulator pressure compensated and check, meter in A
FCV7-10	Flow control and check, meter in A
SV3-10-C	Solenoid 2-way poppet type blocking on A, normally closed
SV3-10-O	Solenoid 2-way poppet type blocking on A, normally open
SV4-10-C	Solenoid 2-way spool type blocking on A, normally closed
SV4-10-O	Solenoid 2-way spool type blocking on A, normally open

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

# Dimensions

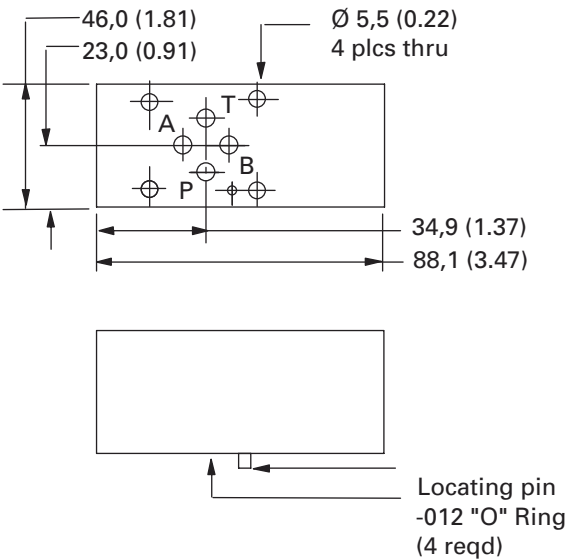
ISO 440103/CETOP3  
Housing Kits

## Dimensions

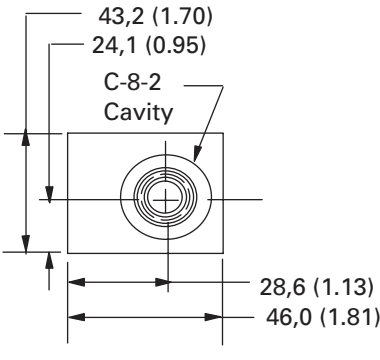
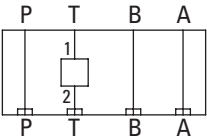
mm (inch)

### A307T Housing Kit

Part Number 02-185357



## Cavity Porting



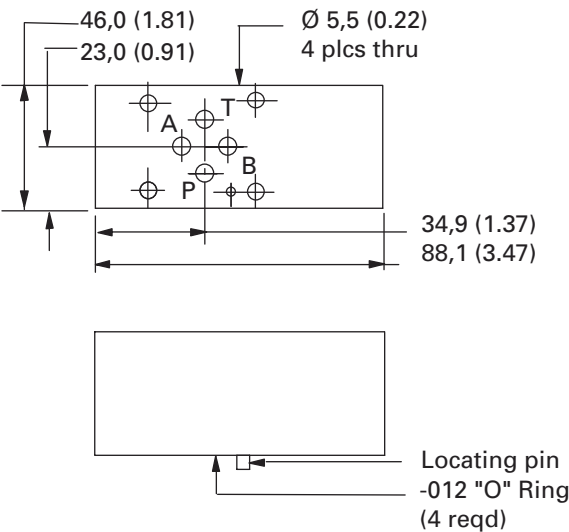
TYPICAL CARTRIDGES	FUNCTION
--------------------	----------

CV3-8	Check valve on T
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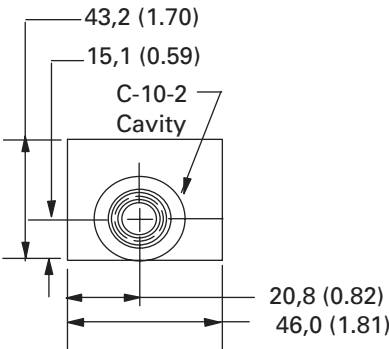
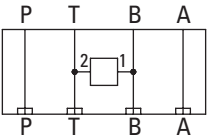
Torque cartridge in housing  
34-40 Nm (25-30 ft. lbs)

### A321B Housing Kit

Part Number 02-185341



## Cavity Porting



TYPICAL CARTRIDGES	FUNCTION
--------------------	----------

ERV1-10	Proportional relief valve B-T
RV1-10	Relief valve B-T
RV5-20	Relief valve B-T

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

# Dimensions

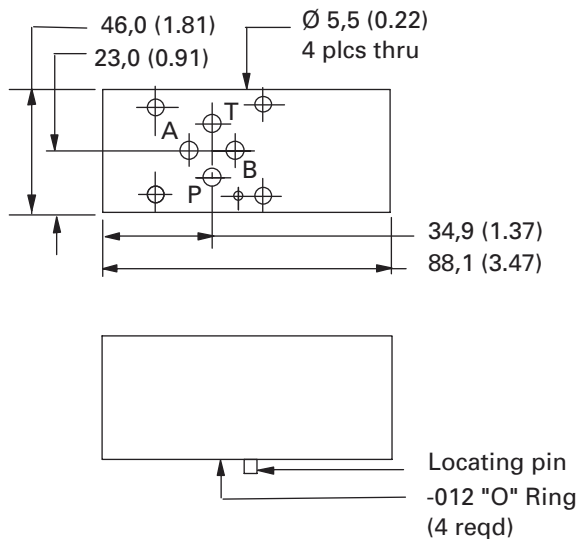
ISO 440103/CETOP3  
Housing Kits

## Dimensions

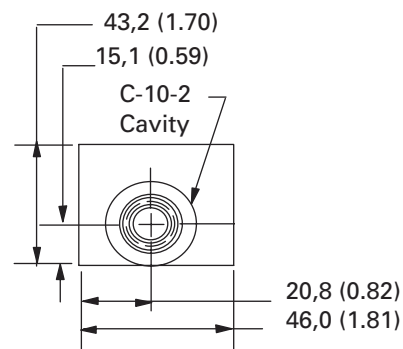
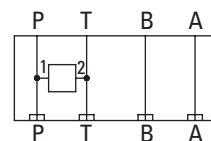
mm (inch)

### A321P Housing Kit

Part Number 02-185342



## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

Note  
This housing may require  
the use of a spacer block  
02-185273 depending upon  
cartridge valve selection.

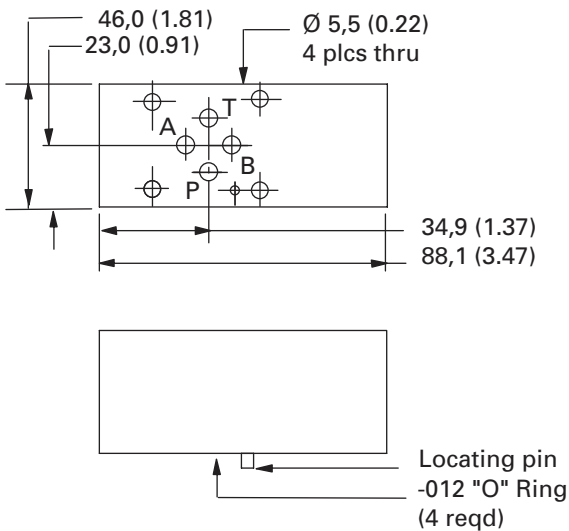
## TYPICAL CARTRIDGES

### FUNCTION

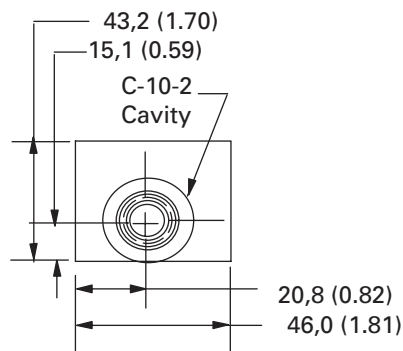
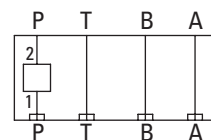
CV16-10-P-O-5	Anti-cavitation check P-T
ERV1-10	Proportional relief valve P-T
RV1-10	Relief valve P-T
RV5-10	Relief valve P-T

### A324P Housing Kit

Part Number 02-185350



## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

Note  
This housing may require  
the use of a spacer block  
02-185273 depending upon  
cartridge valve selection.

## TYPICAL CARTRIDGES

### FUNCTION

CV3-10	Check valve on P
FR5-10	Flow regulator pressure compensated, meter in P
NV1-10	Flow control, meter in P



# Dimensions

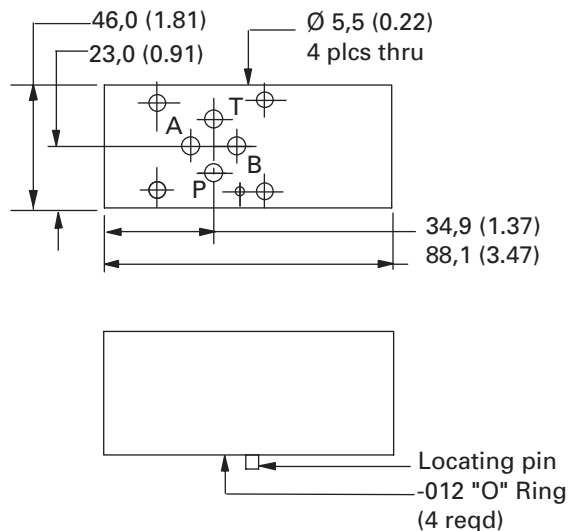
ISO 440103/CETOP3  
Housing Kits

## Dimensions

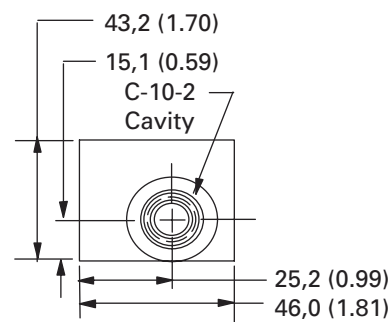
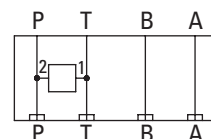
mm (inch)

### A325P Housing Kit

Part Number 02-185352



## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## Note

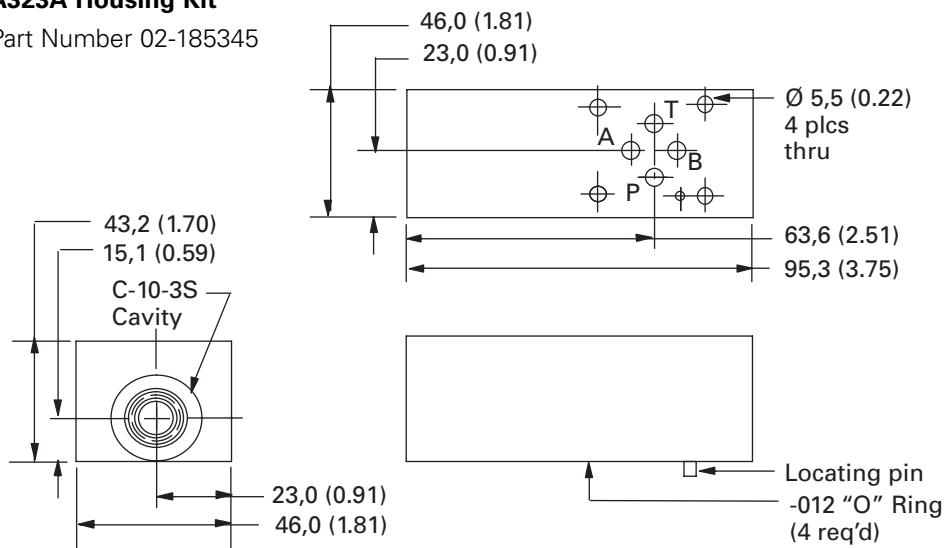
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

## TYPICAL CARTRIDGES FUNCTION

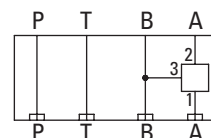
SV1-10-C	Solenoid 2-way poppet type P-T, normally closed
SV3-10-C	Solenoid 2-way poppet type P-T, normally closed
SV3-10-O	Solenoid 2-way poppet type P-T, normally open
SV4-10-C	Solenoid 2-way spool type P-T, normally closed
SV4-10-O	Solenoid 2-way spool type P-T, normally open
SV5-10-O	Solenoid 2-way poppet type P-T, normally open

### A323A Housing Kit

Part Number 02-185345



## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## Note

This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

## TYPICAL CARTRIDGES FUNCTION

CBV*-10	Counterbalance valve on A, pilot from B
POC1-10	Pilot operated check valve on A, pilot from B

# Dimensions

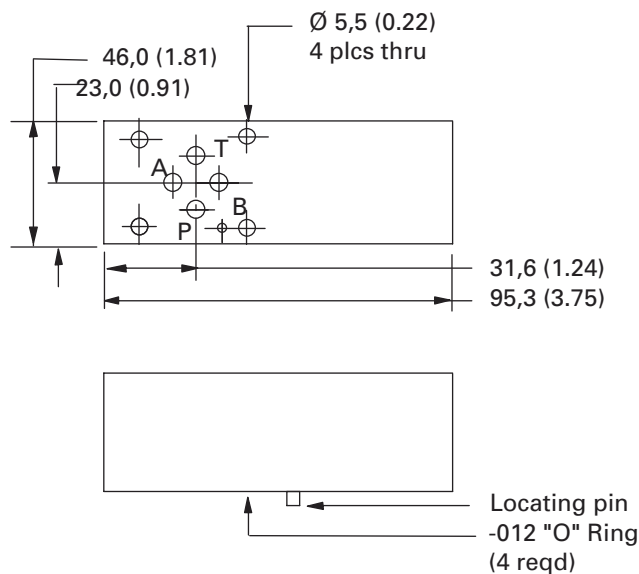
ISO 440103/CETOP3  
Housing Kits

## Dimensions

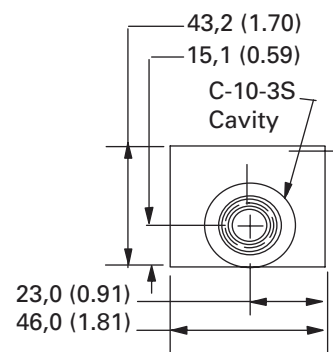
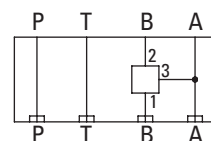
mm (inch)

### A323B Housing Kit

Part Number 02-185346



## Cavity Porting



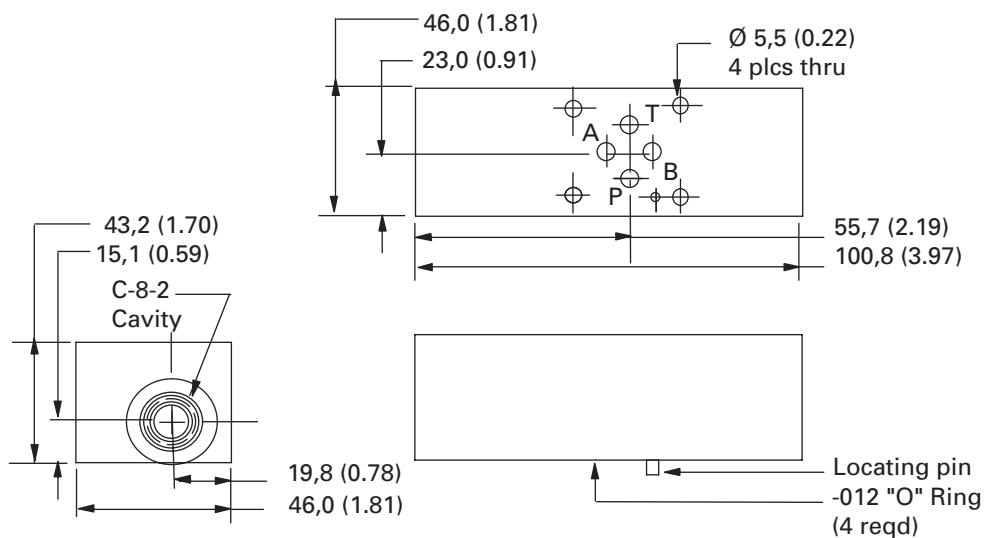
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

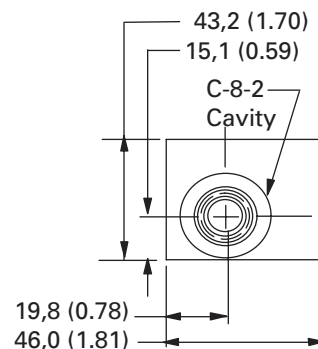
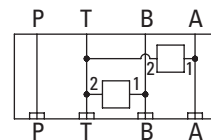
TYPICAL CARTRIDGES	FUNCTION
CBV*-10	Counterbalance valve on B, pilot from A
POC1-10	Pilot operated check valve on B, pilot from A

### A311W Housing Kit

Part Number 02-185364



## Cavity Porting



Torque cartridge in housing  
34-40 Nm (25-30 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
RV1-8	Dual relief valve A-T, B-T

# Dimensions

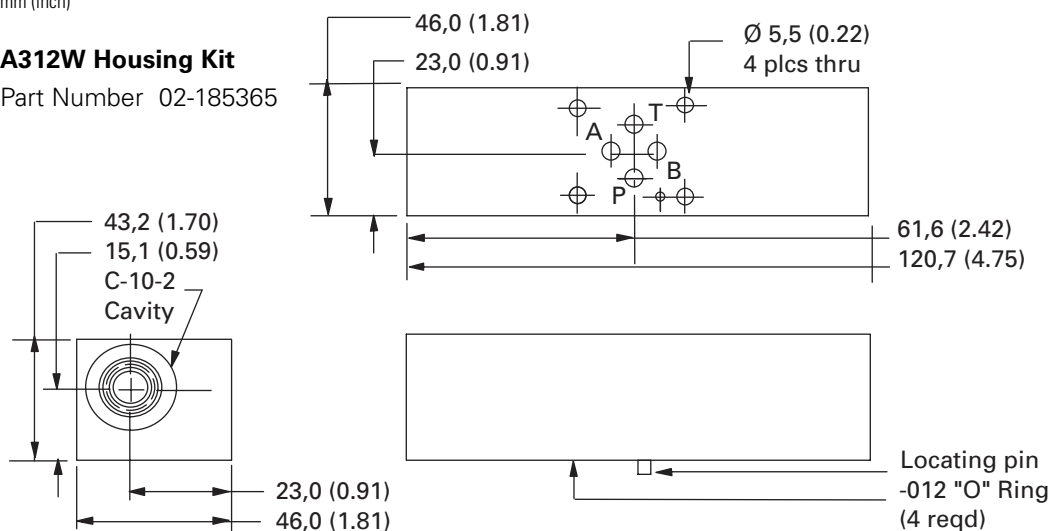
ISO 440103/CETOP3  
Housing Kits

## Dimensions

mm (inch)

### A312W Housing Kit

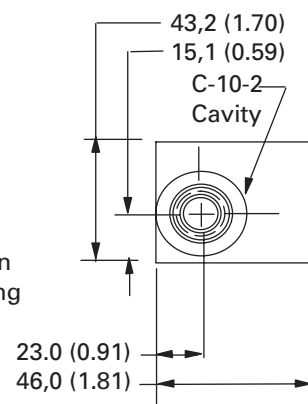
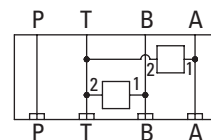
Part Number 02-185365



#### TYPICAL CARTRIDGES FUNCTION

RV1-10	Dual relief valve A-T, B-T
RV5-10	Dual relief valve A-T, B-T

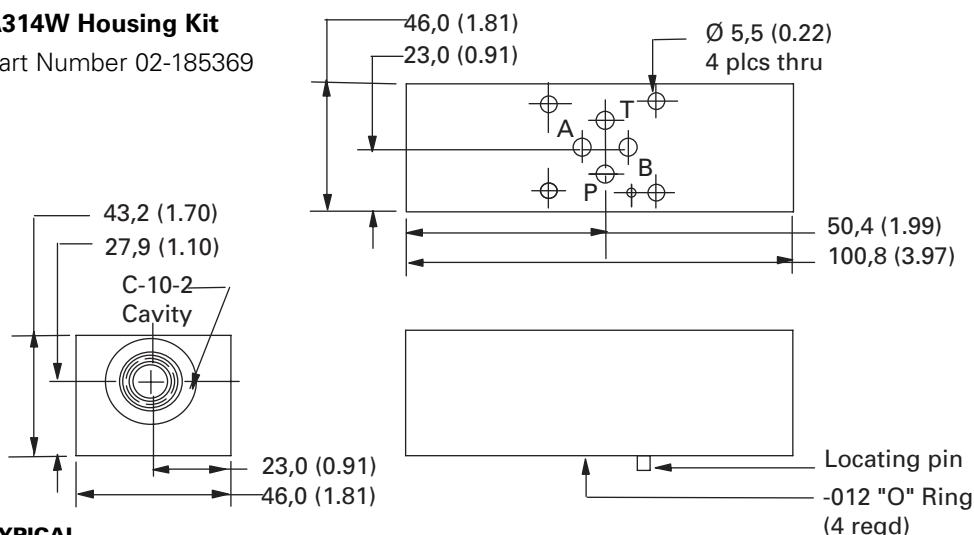
## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

### A314W Housing Kit

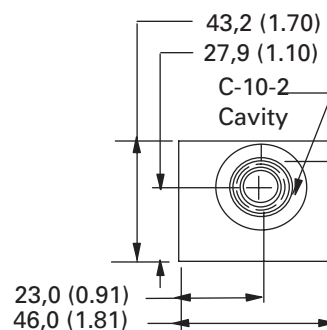
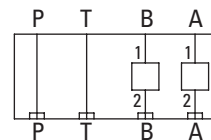
Part Number 02-185369



#### TYPICAL CARTRIDGES FUNCTION

FAR1-10	Flow regulator pressure compensated and check, meter out A & B
FCV7-10	Flow control and check, meter out A & B
SBV11-10-C	Solenoid 2-way poppet type bi-directional load holding on A & B, normally closed
SBV11-10-O	Solenoid 2-way poppet type bi-directional load holding on A & B, normally open
SV3-10-C	Solenoid 2 way poppet type load holding on A & B, normally closed
SV3-10-O	Solenoid 2 way poppet type load holding on A & B, normally open

## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

Note  
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

# Dimensions

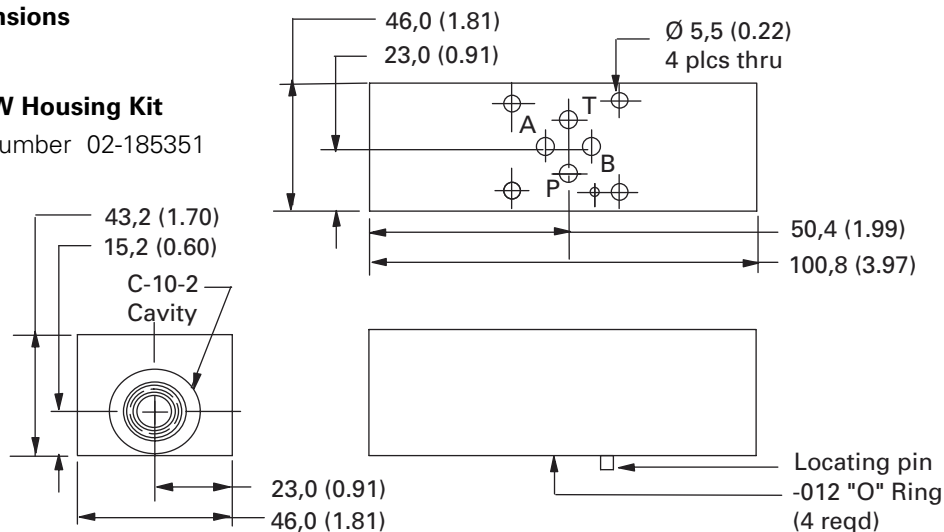
ISO 440103/CETOP3  
Housing Kits

## Dimensions

mm (inch)

### A324W Housing Kit

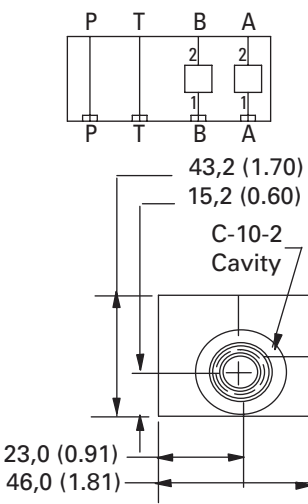
Part Number 02-185351



#### TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
FAR1-10	Flow regulator pressure compensated and check, meter in A & B
FCV7-10	Flow control & check, meter in A & B
SV3-10-C	Solenoid 2-way poppet type blocking on A & B normally closed
SV3-10-O	Solenoid 2-way poppet type blocking on A & B normally open
SV4-10-C	Solenoid 2-way spool type blocking on A & B normally closed
SV4-10-O	Solenoid 2-way spool type blocking on A & B normally open

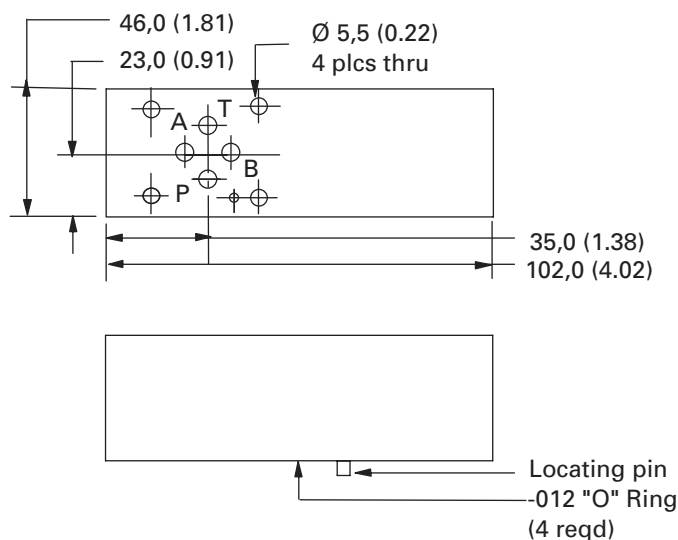
## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

### A326P Housing Kit

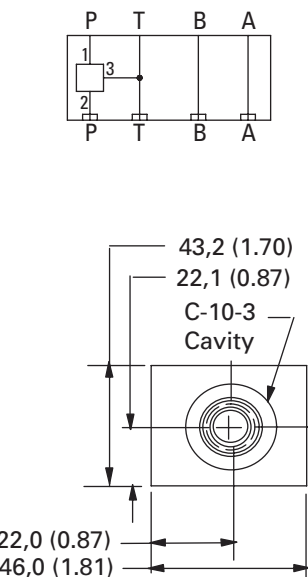
Part Number 02-185353



#### TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
MRV3-10-K-O	Manual rotary selector on P
PRV2-10	Reducing valve (P) drained to T
SV1-10-3	Solenoid 3-way selector on P
SV4-10-3	Solenoid 3-way selector on P

## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

# Dimensions

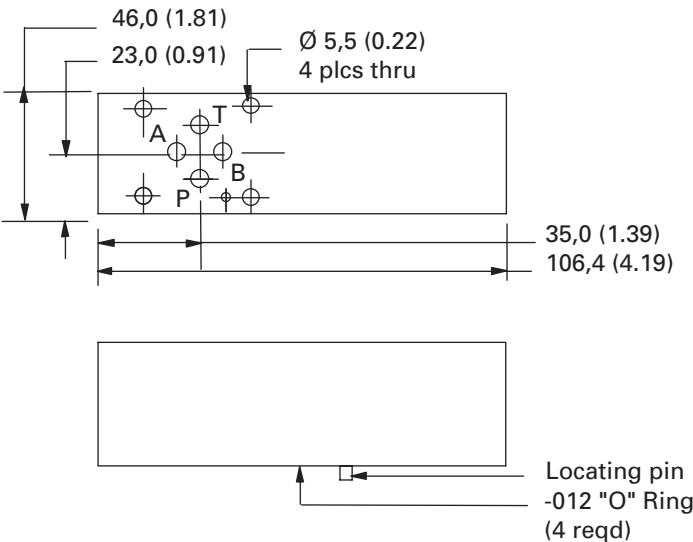
ISO 440103/CETOP3  
Housing Kits

## Dimensions

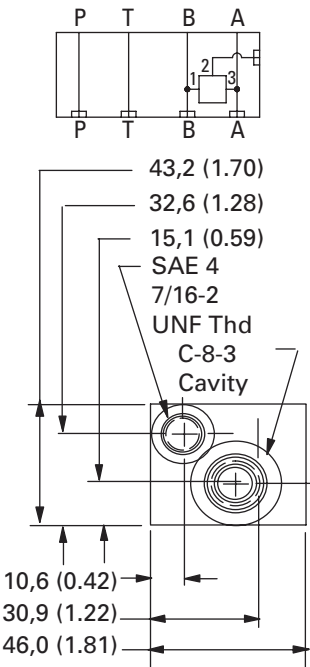
mm (inch)

### A309W Housing Kit

Part Number 02-185361



## Cavity Porting



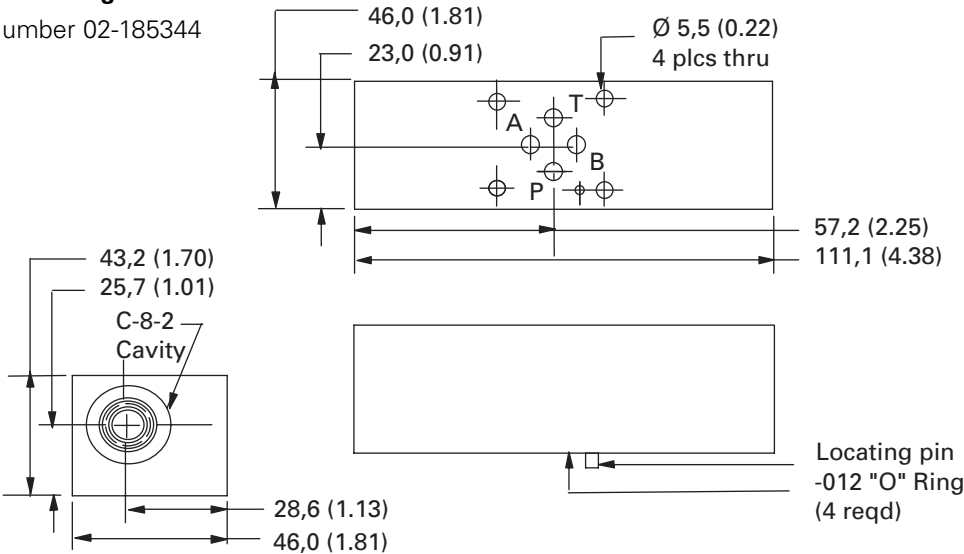
Torque cartridge in housing  
34-40 Nm (25-30 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

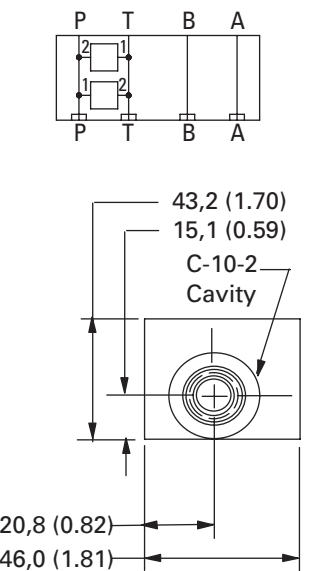
TYPICAL CARTRIDGES	FUNCTION
DSV2-8-B-0	Shuttle valve A & B Output external

### A322P Housing Kit

Part Number 02-185344



## Cavity Porting



Torque cartridge in housing  
C-8-2 34-40 Nm (25-30 ft. lbs)  
C-10-2 48-54 Nm (35-40 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
SV5-8-0 & RV1-10	Solenoid control relief valve P-T, normally open
SV5-8-C & RV1-10	Solenoid control relief valve P-T, normally closed

# Dimensions

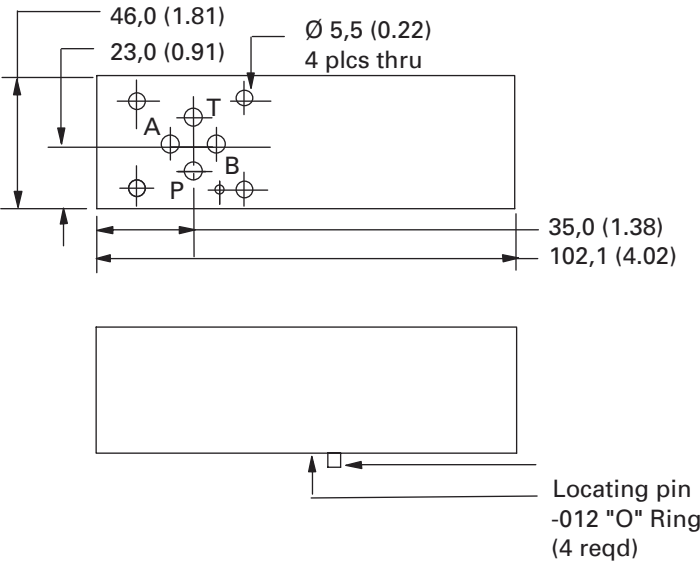
ISO 440103/CETOP3  
Housing Kits

## Dimensions

mm (inch)

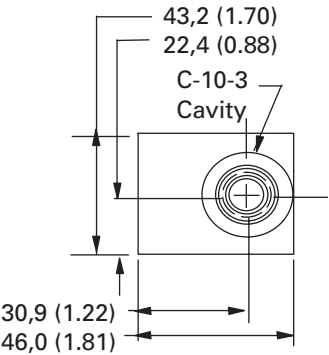
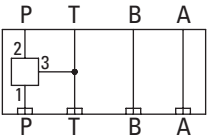
### A316P Housing Kit

Part Number 02-185374



TYPICAL CARTRIDGES	FUNCTION
PSV7-10	Sequence valve in to P

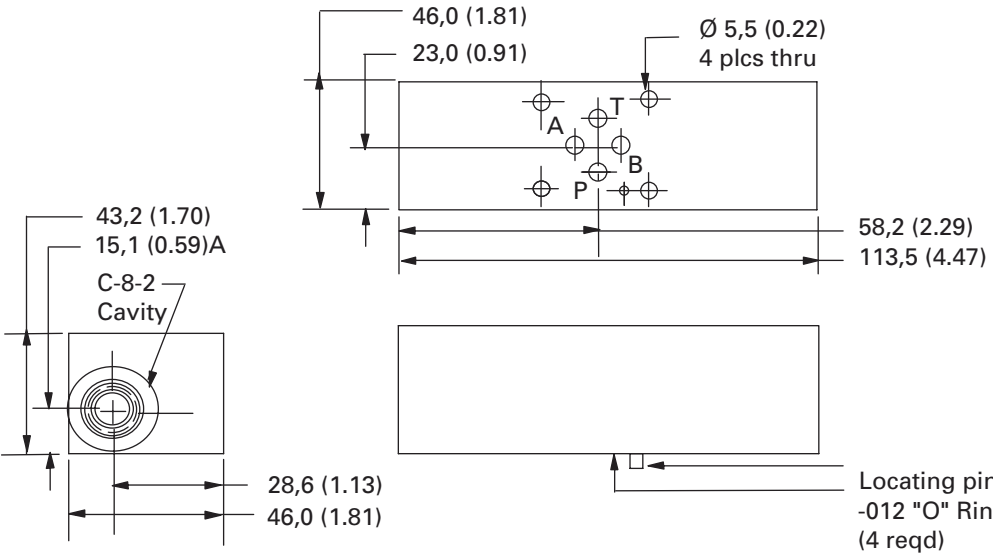
## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

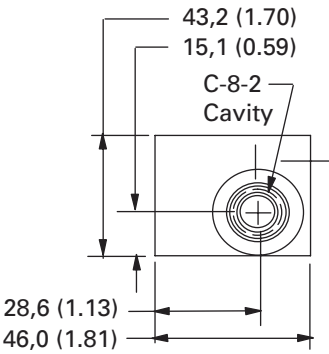
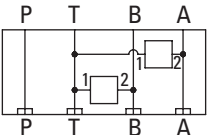
### A320T Housing Kit

Part Number 02-185379



TYPICAL CARTRIDGES	FUNCTION
CV3-8	Check valve on T to A & B

## Cavity Porting



Torque cartridge in housing  
34-40 Nm (25-30 ft. lbs)

# Dimensions

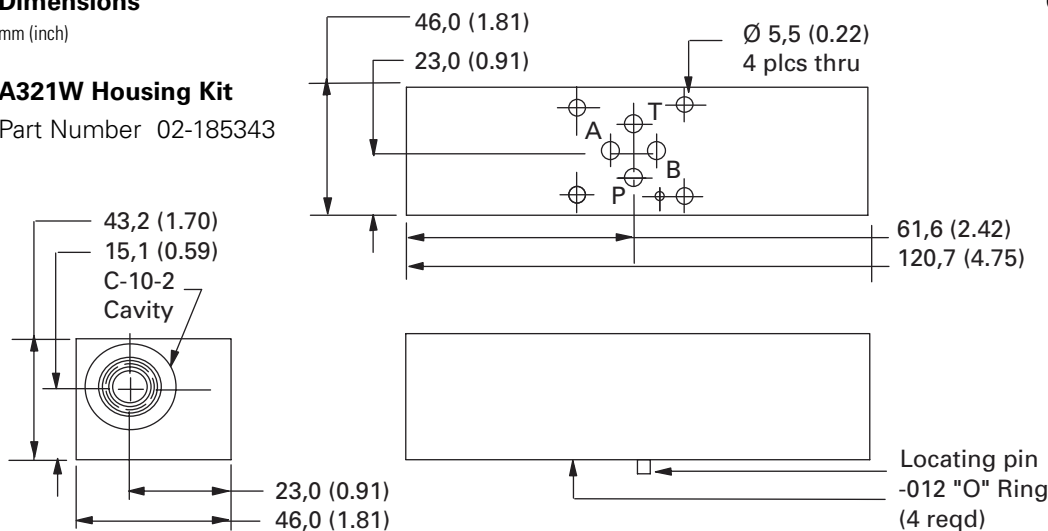
ISO 440103/CETOP3  
Housing Kits

## Dimensions

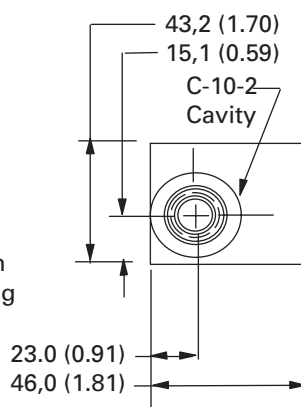
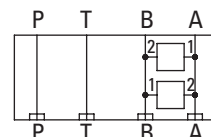
mm (inch)

### A321W Housing Kit

Part Number 02-185343



## Cavity Porting



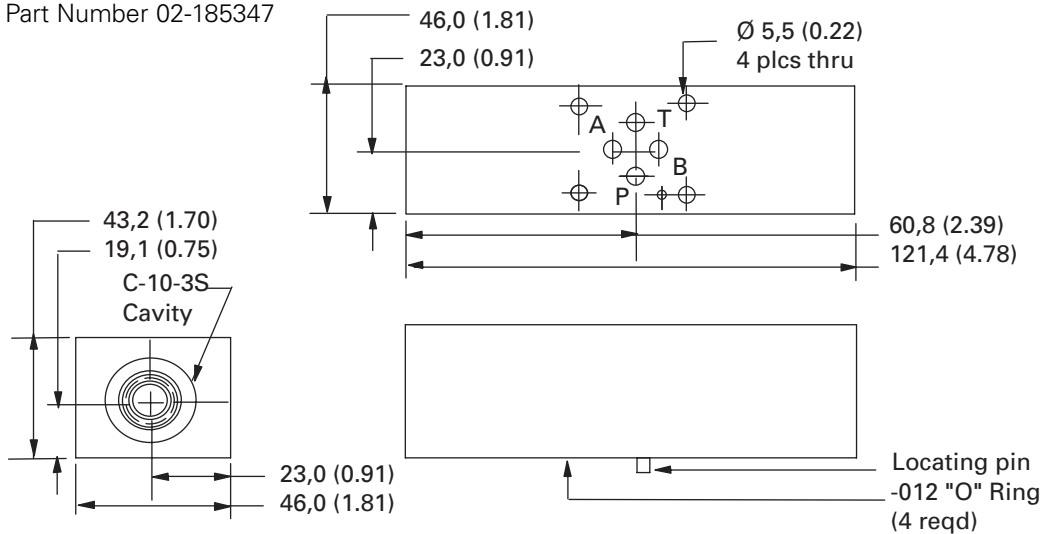
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

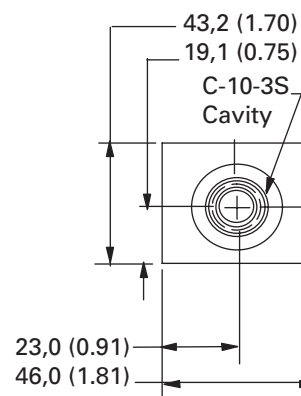
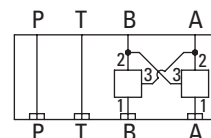
RV1-10	Cross port relief valve A & B
RV5-10	Cross port relief valve A & B

### A323W Housing Kit

Part Number 02-185347



## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

CBV*-10	Counterbalance valve on A & B cross piloted
POC1-10	Pilot operated check valve on A & B cross piloted

# Dimensions

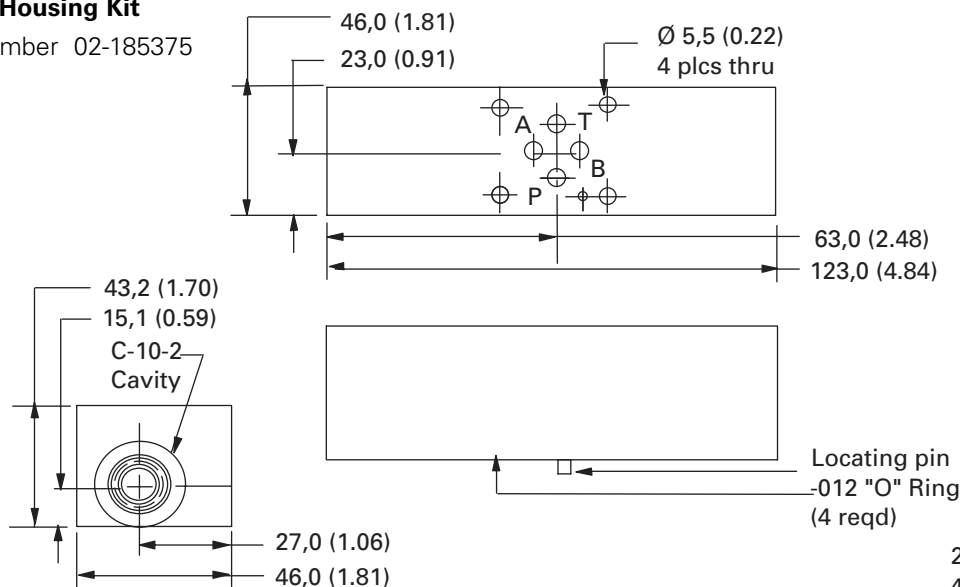
ISO 440103/CETOP3  
Housing Kits

## Dimensions

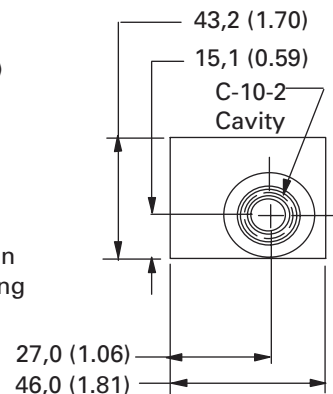
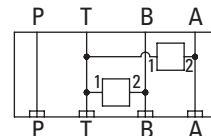
mm (inch)

### A317T Housing Kit

Part Number 02-185375



### Cavity Porting



### TYPICAL CARTRIDGES FUNCTION

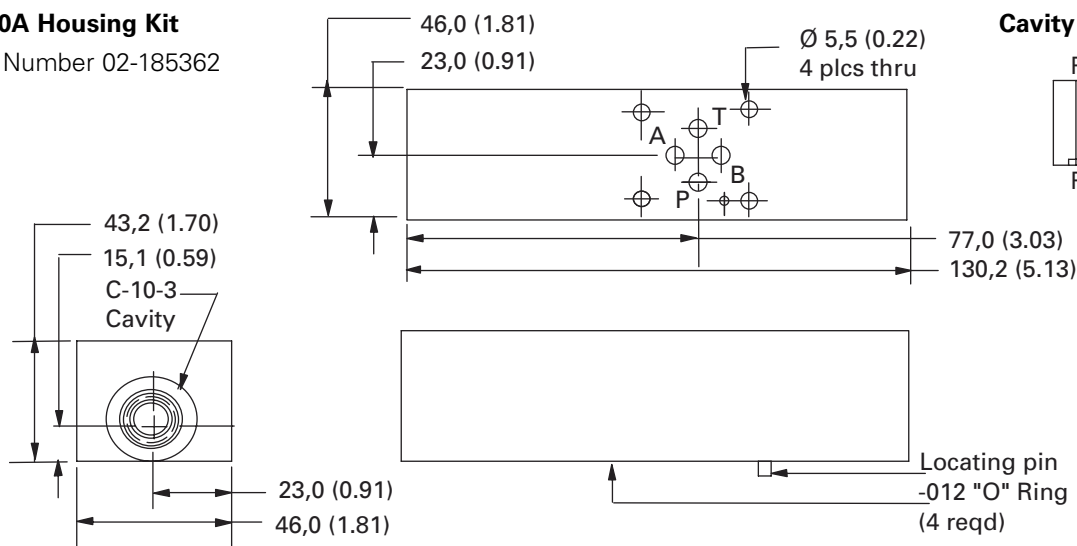
CV3-10	Check valve on T to A & B
SV1-10-C	Solenoid 2-way poppet type unload A & B-T, normally closed
SV3-10-C	Solenoid 2-way poppet type unload A & B-T, normally closed
SV3-10-O	Solenoid 2-way poppet type unload A & B-T, normally open
SV4-10-C	Solenoid 2-way spool type unload A & B-T, normally closed
SV4-10-O	Solenoid 2-way spool type unload A & B-T, normally open
SV5-10-O	Solenoid 2-way poppet type unload A & B-T, normally open

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

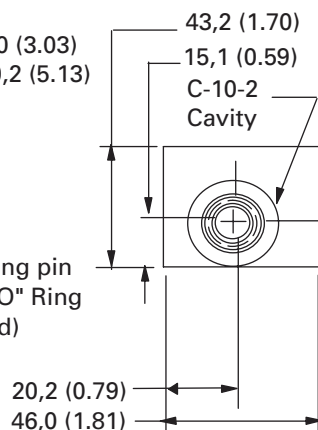
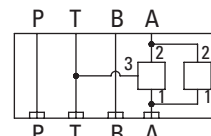
Note  
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

### A310A Housing Kit

Part Number 02-185362



### Cavity Porting



### TYPICAL CARTRIDGES FUNCTION

PRV2-10 & CV3-10-P-3	Reducing on A drained to T reverse free flow check
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Note  
This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)



# Dimensions

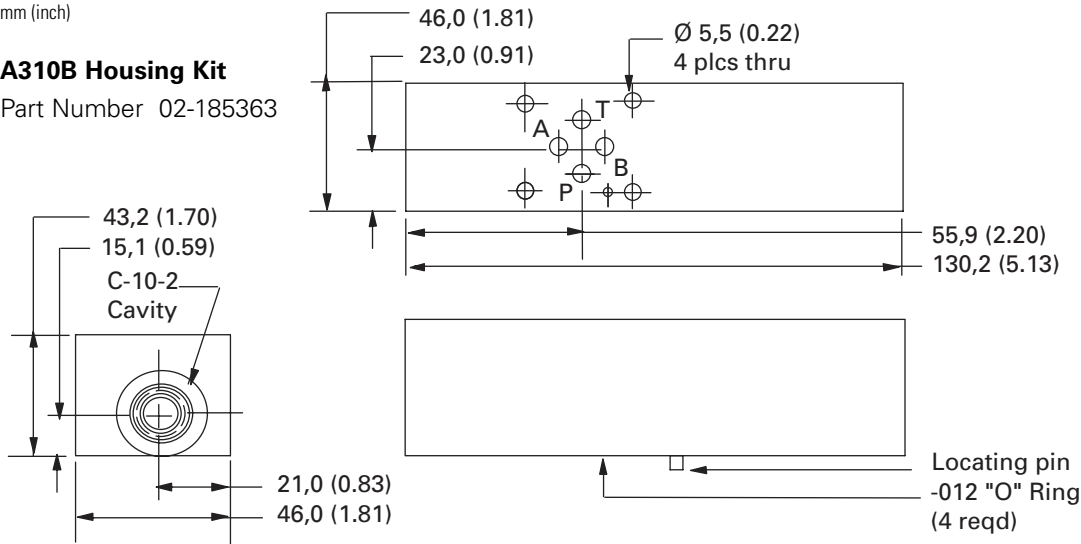
ISO 440103/CETOP3  
Housing Kits

## Dimensions

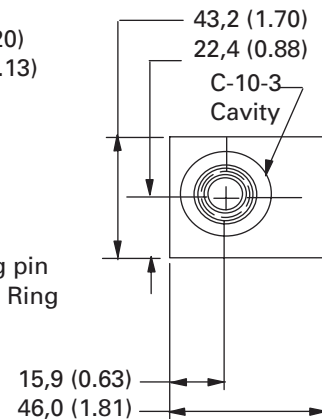
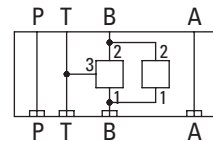
mm (inch)

### A310B Housing Kit

Part Number 02-185363



## Cavity Porting



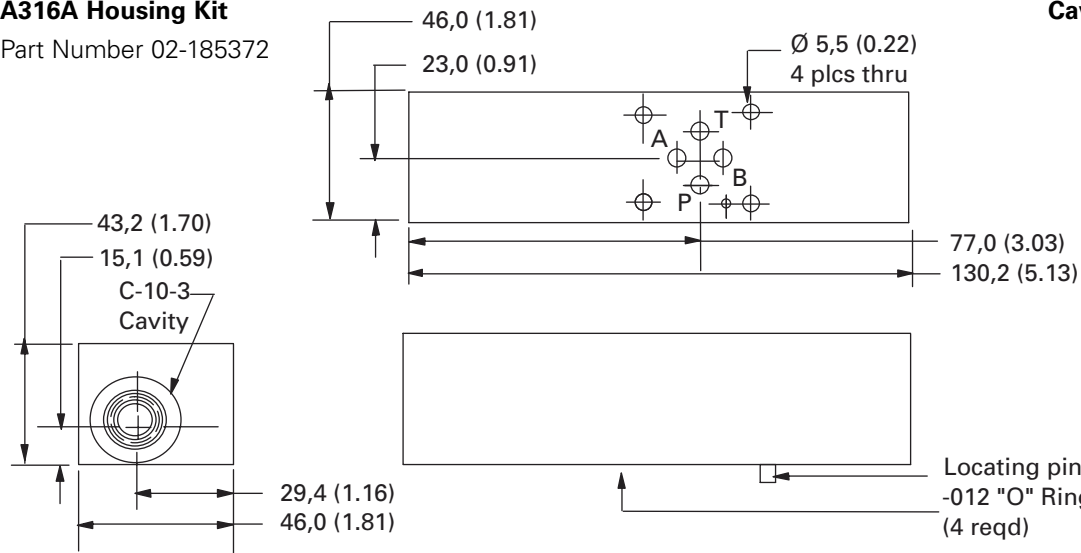
## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
PRV7-10 & CV3-10-P-0-3	Reducing on B drained to T reverse free flow check

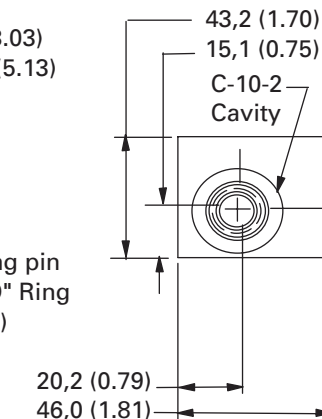
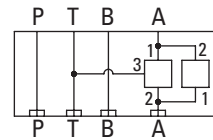
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

### A316A Housing Kit

Part Number 02-185372



## Cavity Porting



## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
PSV7-10 & CV3-10-P-0-3	Sequence valve in to A reverse free flow check

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

# Dimensions

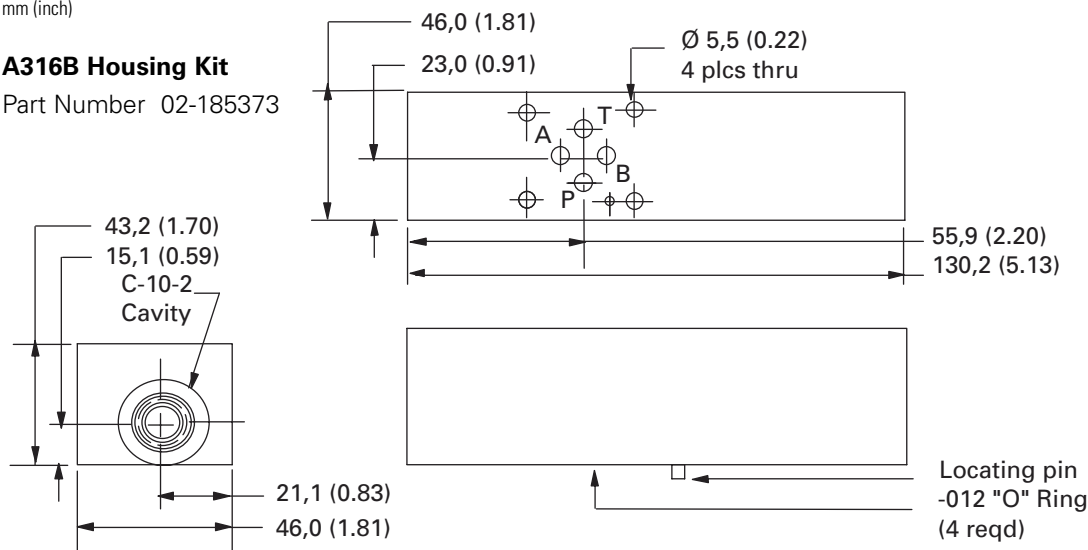
ISO 440103/CETOP3  
Housing Kits

## Dimensions

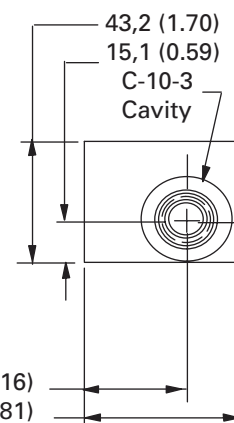
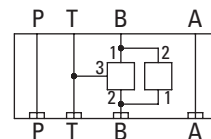
mm (inch)

### A316B Housing Kit

Part Number 02-185373



## Cavity Porting



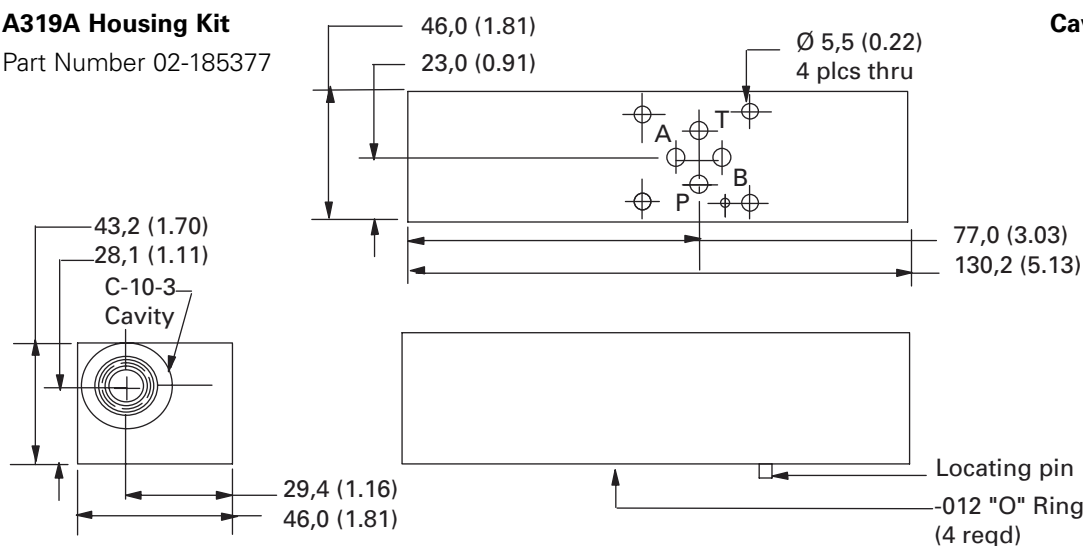
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

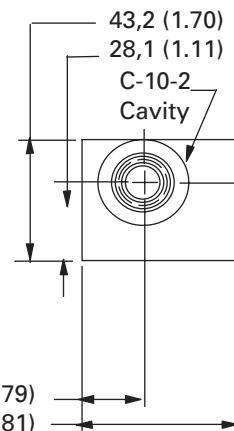
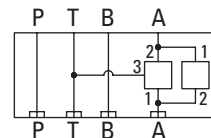
PSV7-10 & CV3-10-P-0-3	Sequence valve in to B reverse free flow check
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### A319A Housing Kit

Part Number 02-185377



## Cavity Porting



Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

## TYPICAL CARTRIDGES FUNCTION

PSV7-10 & CV3-10-P-0-3	Sequence valve out of A reverse free flow check
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# Dimensions

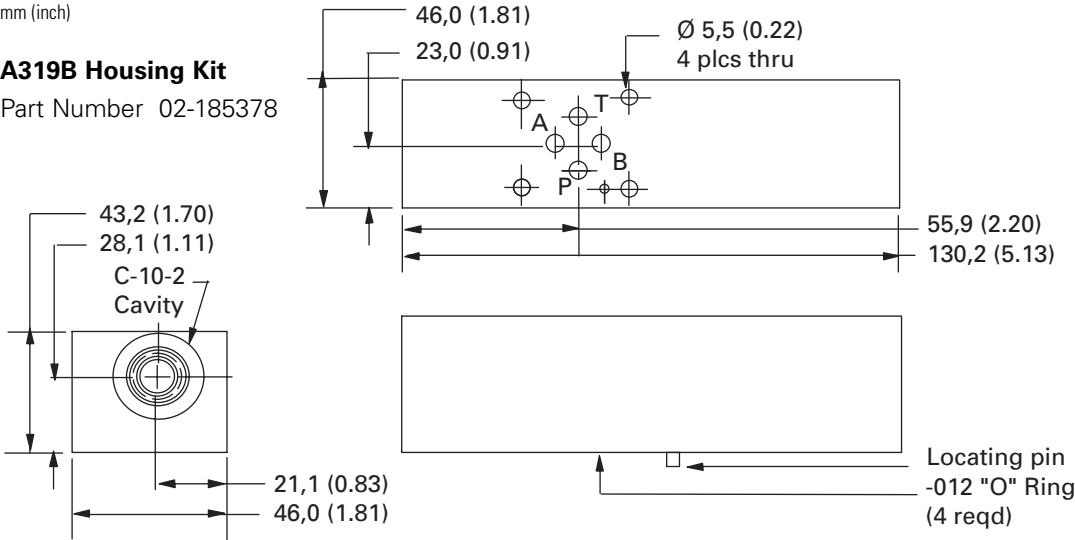
ISO 440103/CETOP3  
Housing Kits

## Dimensions

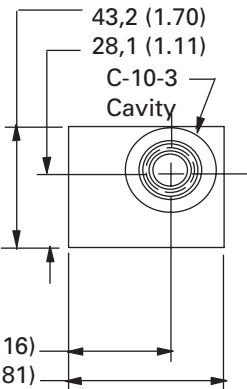
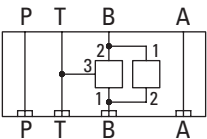
mm (inch)

### A319B Housing Kit

Part Number 02-185378



## Cavity Porting



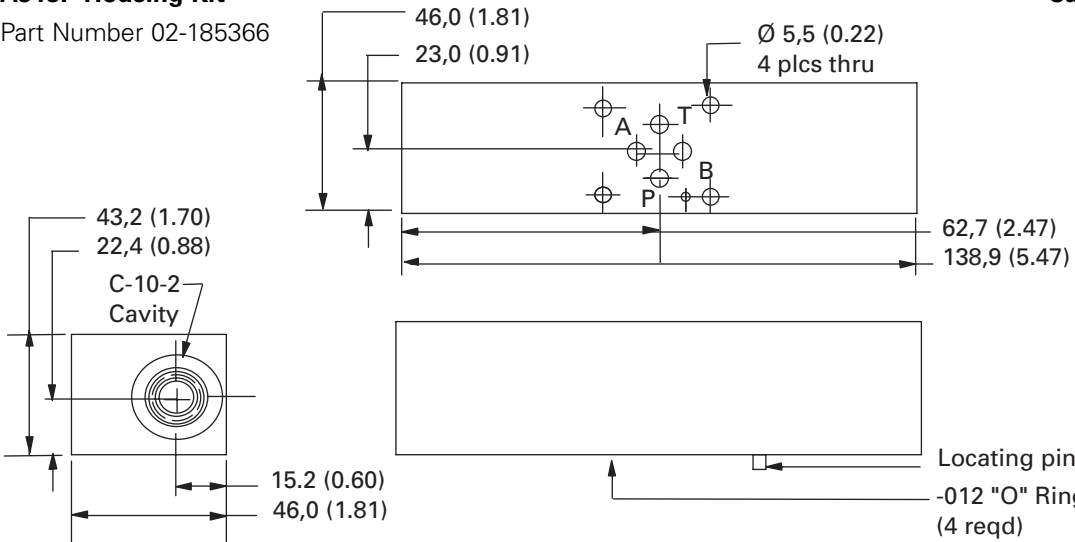
## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
PSV7-10 & CV3-10-P-0-3	Sequence valve out of B reverse free flow check

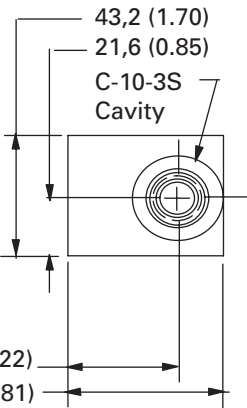
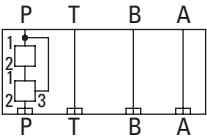
Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

### A313P Housing Kit

Part Number 02-185366



## Cavity Porting



## TYPICAL CARTRIDGES FUNCTION

TYPICAL CARTRIDGES	FUNCTION
EPV-10 & DPS2-10-F-F-0-160	Proportional flow control pressure compensated on P

Torque cartridge in housing  
48-54 Nm (35-40 ft. lbs)

# Dimensions

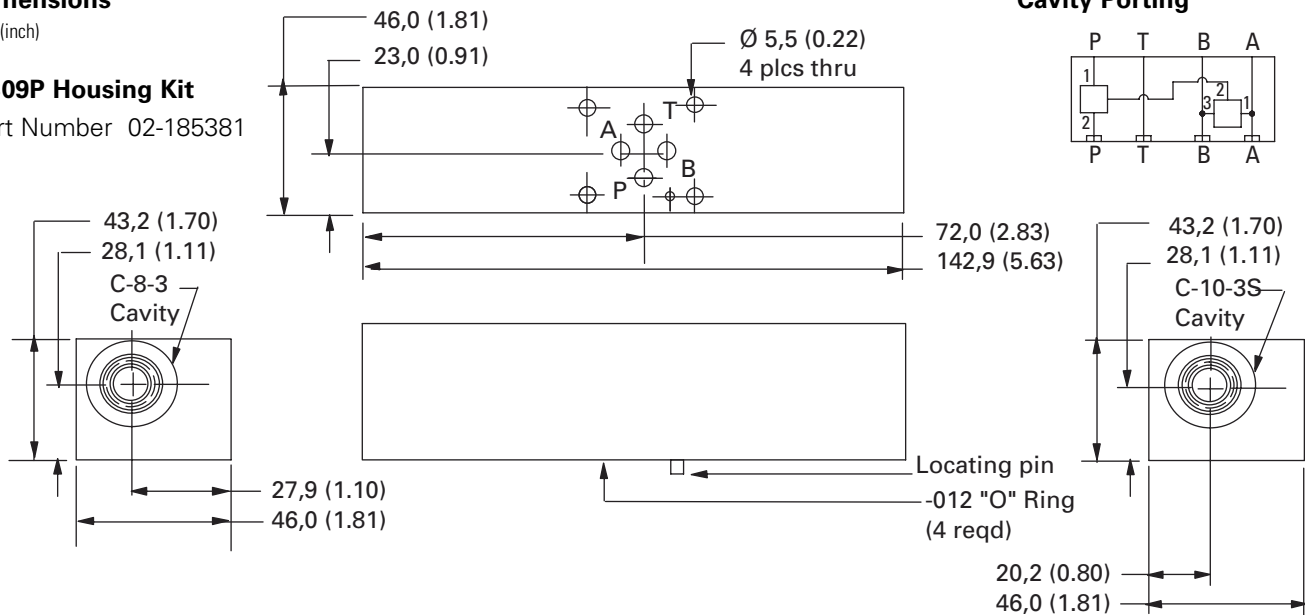
ISO 440103/CETOP3  
Housing Kits

## Dimensions

mm (inch)

### A309P Housing Kit

Part Number 02-185381



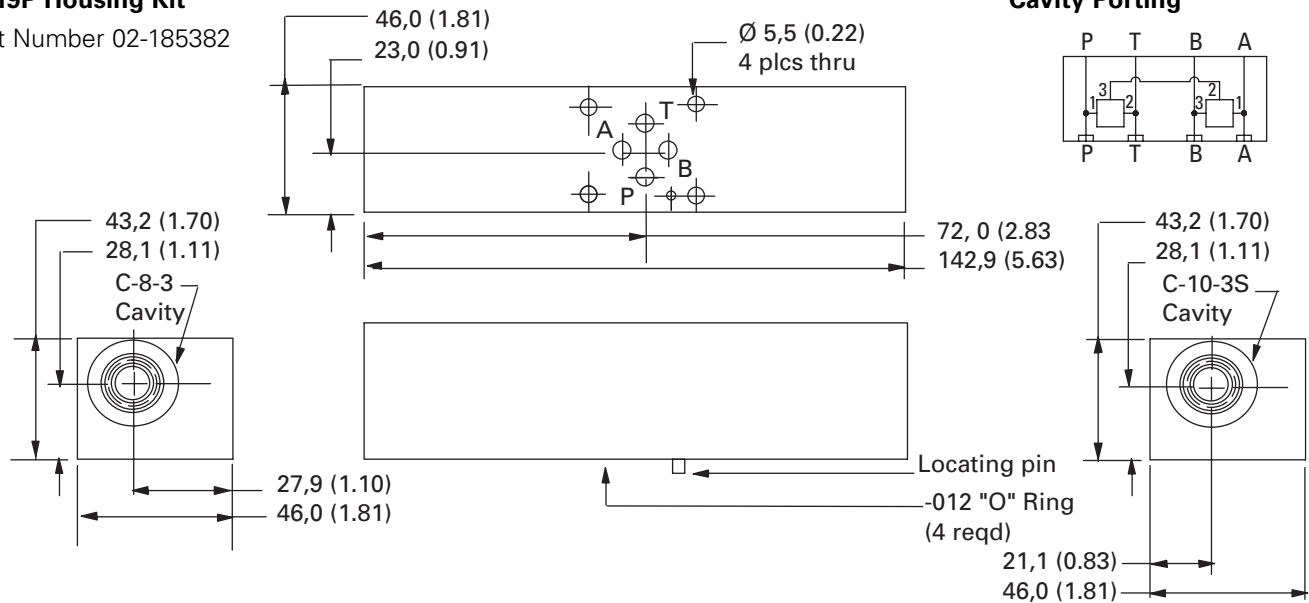
## TYPICAL CARTRIDGES FUNCTION

DPS2-10-F-F-0-\* Pressure compensator restrictive on P with shuttle sense from A & B  
& DSV2-8-B-0

Torque cartridge in housing  
C-8-3 34-40 Nm (25-30 ft. lbs)  
C-10-3S 48-54 Nm (35-40 ft. lbs)

### A319P Housing Kit

Part Number 02-185382



## TYPICAL CARTRIDGES FUNCTION

DPS2-10-P-F-0-\* Pressure compensator bypass to T with shuttle sense from A & B  
& DSV2-8-B-0

Torque cartridge in housing  
C-8-3 34-40 Nm (25-30 ft. lbs)  
C-10-3 48-54 Nm (35-40 ft. lbs)