

Sandwich valves

For applications up to 210 bar (3000 psi)



Powering Business Worldwide

Sandwich valves

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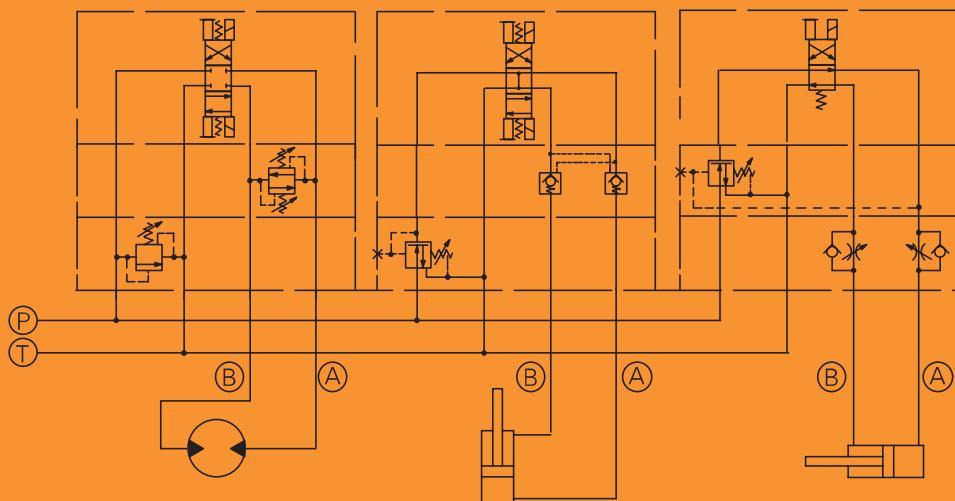
Typical Sandwich Valve System

⚠ 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 Eaton 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.

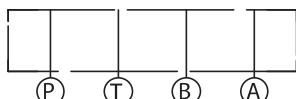


Figure 1

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).

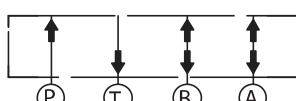


Figure 2

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

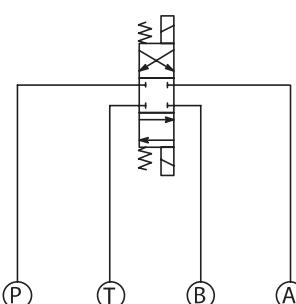


Figure 3

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).

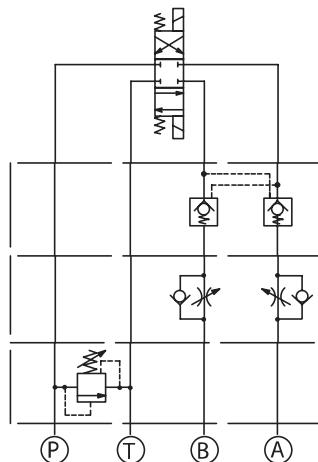


Figure 4

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.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Sandwich valves - 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 L6 thru L19.

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.)

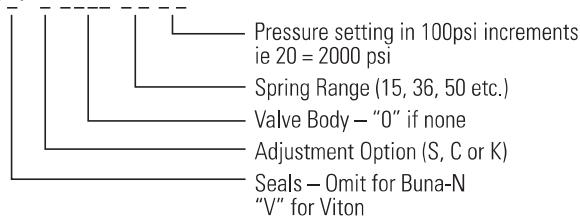
For example:

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

Two examples are shown below:

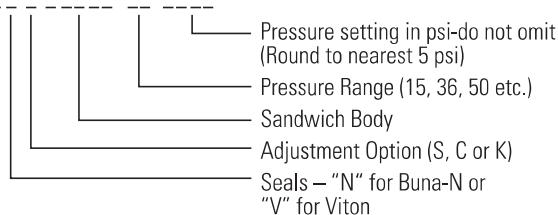
Base valve model code

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



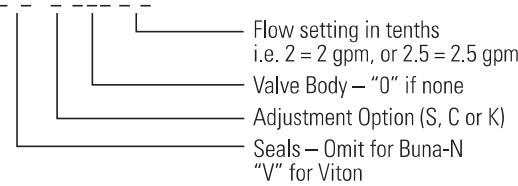
Sandwich valve model code (D03)

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



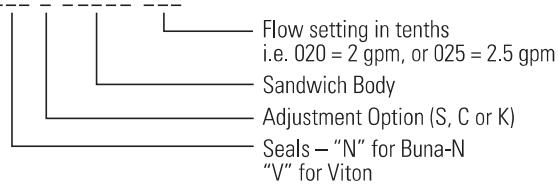
Base valve model code

FAR1-12(V)-**-****



Sandwich valve model code (relieving from P to T) (D05)

FAR1-12*-A524A-*****



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Spare parts

For sandwich valve assemblies

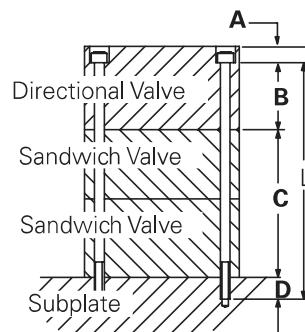
Accessory plates & stud rods

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

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

Note: Bolts should be torqued to 4.5-6.0 Nm (40-53 in. lbs) with threads lubricated.

Note: If not using Eaton bolt kits, bolts must be to Grade 12.9 (ISO 898) or better.

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.

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Powering Business Worldwide

Sandwich valves

CETOP05 Sandwich valve bodies and assemblies
for applications up to 210 bar (3000 psi)



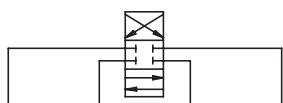
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Pressure control functions

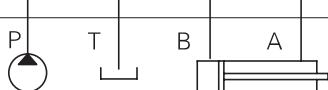
Sandwich valves locator
ISO 4401-03/CETOP03 series

⚠ Caution

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



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

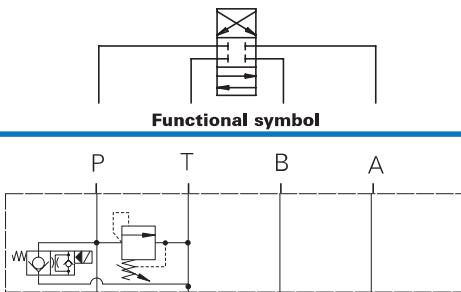
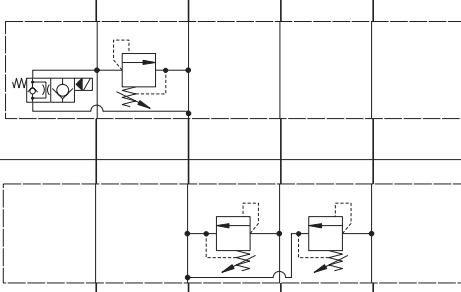
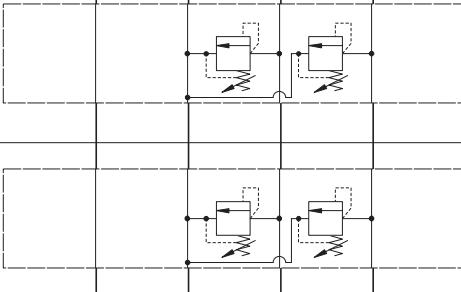
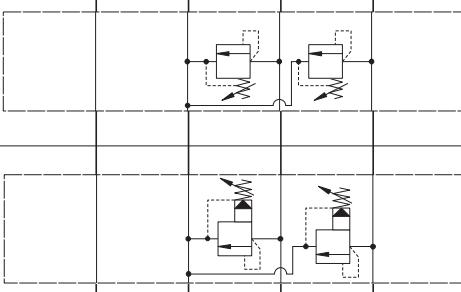
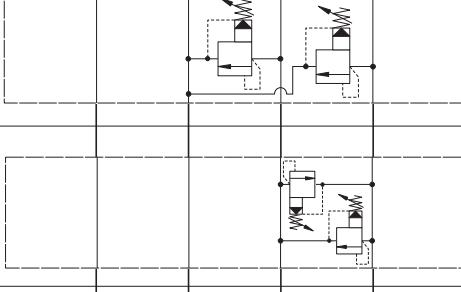
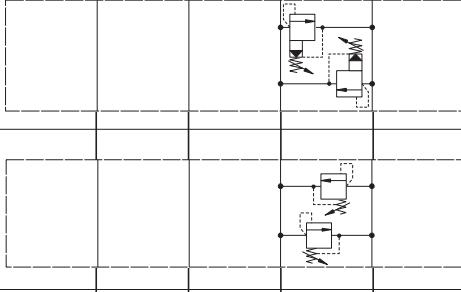
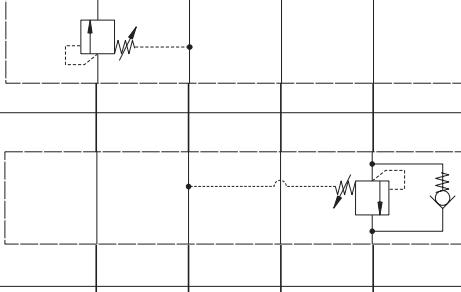
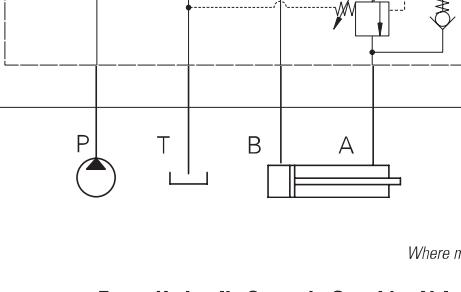


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⚠ Caution

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Pressure control functions

Function	Functional symbol	Model code	Housing kit
Solenoid Controlled Relief Valve P-T Normally Opened	P T B A 	SRV 10 * 0 S A322P 35/**** 00 Refer to page L-20 for model code breakdown	Model Part No. A322P 02-185344 Cartridge Cartridge Data Sheet SV5-8/RV1-10 Section A/E C-8-2/C-10-2
Solenoid Controlled Relief Valve P-T Normally Closed	P T B A 	SRV 10 * C S A322P 35/**** 00 Refer to page L-20 for model code breakdown	Model Part No. A322P 02-185344 Cartridge Cartridge Data Sheet SV5-8-C/ RV1-10 Section A/E C-8-2/C-10-2
Dual Relief Valve A-T, B-T	P T B A 	1DR30 * A311W A** *B** * 00 Refer to page L-21 for model code breakdown	Model Part No. A311W 02-185364 Cartridge Cartridge Data Sheet 1DR30 qty 2 Section E C-8-2 qty. 2
Dual Relief valve A-T, B-T	P T B A 	RV1 10 ** A312W A**/****B**/**** 00 Refer to page L-20 for model code breakdown	Model Part No. A312W 02-185365 Cartridge Cartridge Data Sheet RV1-10 qty 2 Section E C-10-2 qty 2
Dual Relief valve A-T, B-T	P T B A 	RV5 10 ** A312W A**/****B**/**** 00 Refer to page L-20 for model code breakdown	Model Part No. A312W 02-185365 Cartridge Cartridge Data Sheet RV5-10 qty 2 Section E C-10-2 qty 2
Cross Port Relief Valve A-B	P T B A 	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 RV3A-10 qty 2 Section E C-10-2 qty 2
Cross Port Relief Valve A-B	P T B A 	RV5A 10 ** A321W A**/****B**/**** 00 Refer to page L-20 for model code breakdown	Model Part No. A321W 02-185343 Cartridge Cartridge Data Sheet RV5-10 qty 2 Section E C-10-2 qty 2
Sequence Valve In to P	P T B A 	PSV7 10 ** A316P **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A316P 02-185374 Cartridge Cartridge Data Sheet PSV7-10 Section E C-10-3
Sequence Valve In to A Reverse FF Check	P T B A 	PSV7 10 ** A316A **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A316A 02-185372 Cartridge Cartridge Data Sheet PSV7-10/ CV3-10 Section E/G C-10-3/C-10-2

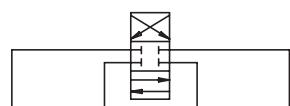


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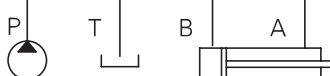
Pressure control functions

Caution

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



Function	Functional symbol	Model code	Housing kit
Sequence Valve Out of A Reverse FF Check		PSV7 10 * * A319A **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A319A Cartridge PSV7-10/CV3-10 Cavity Section E/G C-10-3/C-10-2
Sequence Valve In to B Reverse FF Check		PSV7 10 * * A316B **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A316B Cartridge PSV7-10/CV3-10 Cavity Section E/G C-10-3/C-10-2
Sequence Valve Out of B Reverse FF Check		PSV7 10 * * A319B **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A319B Cartridge PSV7-10/CV3-10 Cavity Section E/G C-10-3/C-10-2
Reducing Valve on (P) Drained to T		PRV2 10 * * A326P **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A326P Cartridge PRV2-10 Cavity Section E/C-10-3
Reducing on A Drained to T Reverse FF Check		PRV2 10 * * A310A **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A310A Cartridge PRV2-10/CV3-10 Cavity Section E/G C-10-3/C-10-2
Reducing on B Drained to T Reverse FF Check		PRV2 10 * * A310B **/**** 00 Refer to page L-21 for model code breakdown	Hsg kit: model Part No. A310B Cartridge PRV2-10/CV3-10 Cavity Section E/G C-10-3/C-10-2
Pressure Compensator Restrictive on P w/Shuttle Sense from A & B		PCR 10 * A309P *** 00 Refer to page L-22 for model code breakdown	Model Part No. A309P Cartridge DPS2-10-F-F-0/DSV2-8 Cavity Section L/G C-10-3S/C-8-3
Pressure Compensator Bypass to T w/Shuttle Sense from A & B		PCB 10 * * A319P *** 00 Refer to page L-22 for model code breakdown	Model Part No. A319P Cartridge DPS2-10-P-F-0/DSV2-8 Cavity Section L/G C-8-3/C-10-3S

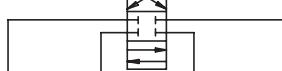


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Check & pilot check functions

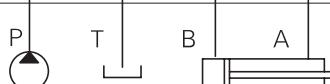


Functional symbol

Model code

Housing kit

Function	Functional symbol	Model code	Housing kit
Pilot Operated Check Valve On A Pilot from B		4CK30 * A323A *** 00	Model Part No. A323A 6025820-001 Cartridge Cartridge Data Sheet 4CK30 Section G Cavity A6610
Pilot Operated Check Valve On B Pilot from A		4CK30 * A323B *** 00	Model Part No. A323B 6025821-001 Cartridge Cartridge Data Sheet 4CK30 Section G Cavity A6610
Pilot Operated Check Valve On A & B Cross Piloted		4CK30 * A323W *** 00	Model Part No. A323W 6025822-001 Cartridge Cartridge Data Sheet 4CK30 Section G Cavity A6610
Check Valve On P		CV3 8 * P A307P *** 00	Model Part No. A307P 02-185356 Cartridge Cartridge Data Sheet CV3-8 Section G C-8-2 Cavity
Check Valve On P		CV3 10 * P A324P *** 00	Model Part No. A324P 02-185350 Cartridge Cartridge Data Sheet CV3-10 Section G C-10-2 Cavity
Check Valve on T		CV3 8 * P A307T *** 00	Hsg kit: model Part No. A307T 02-185357 Cartridge Cartridge Data Sheet CV3-8 Section G C-8-2 Cavity
Check Valve On T		CV3 10 * P A308T *** 00	Model Part No. A308T 02-185360 Cartridge Cartridge Data Sheet CV3-10 Section G C-10-2 Cavity
Check Valve On A Free Flow Out		CV3 8 * P A307A *** 00	Model Part No. A307A 02-185354 Cartridge Cartridge Data Sheet CV3-8 Section G C-8-2 Cavity
Check Valve On A Free Flow Out		CV3 10 * P A314A *** 00	Model Part No. A314A 02-185367 Cartridge Cartridge Data Sheet CV3-10 Section G C-10-2 Cavity

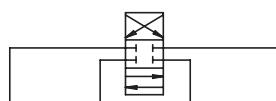


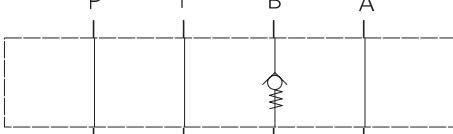
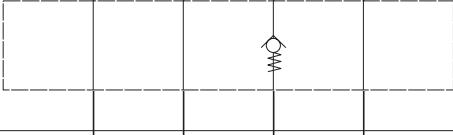
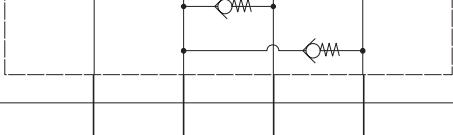
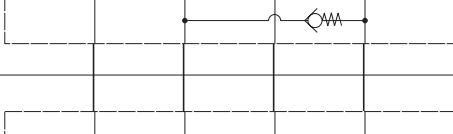
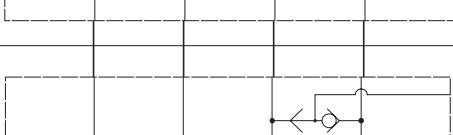
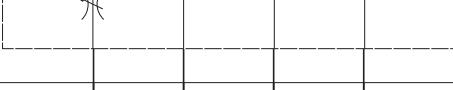
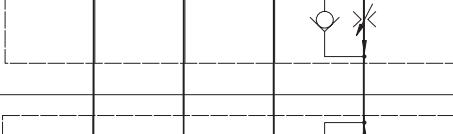
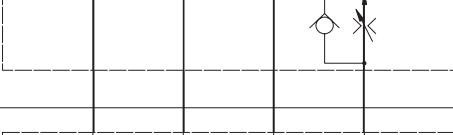
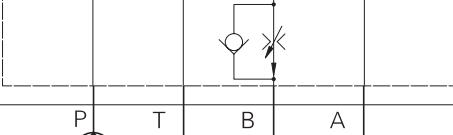
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Check and flow control functions

Caution

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



Function	Functional symbol	Model code	Housing kit
Check Valve On B Free Flow Out		CV3 8 * P A307B *** 00	Model Part No. A307B Cartridge CV3-8 Cartridge Data Sheet Section G Cavity C-8-2
Check Valve On B Free Flow Out		CV3 10 * P A314B *** 00	Model Part No. A314B Cartridge CV3-10 Cartridge Data Sheet Section G Cavity C-10-2
Check Valve On T On A & B		CV3 8 * P A320T *** 00	Model Part No. A320T Cartridge CV3-8 qty 2 Cartridge Data Sheet Section G Cavity C-8-2 qty 2
Check Valve on T to A & B		CV10 10 * P A317T *** 00	Model Part No. A317T Cartridge CV3-10 qty 2 Cartridge Data Sheet Section G Cavity C-10-2 qty 2
Anti-Cavitation Check P-T		CV16 10 * P A321P *** 00	Model Part No. A321P Cartridge CV16-10-P-0-5 Cartridge Data Sheet Section G Cavity C-10-2
Shuttle Valve A & B Output External		DSV2 8 * B A309W 00	Model Part No. A309W Cartridge DSV2-8-B-0 Cartridge Data Sheet Section G Cavity C-8-3
Flow Control Meter in P		NV1 10 * * A324P 00	Model Part No. A324P Cartridge NV1-10 Cartridge Data Sheet Section H Cavity C-10-2
Flow Control & Check Meter in A		FCV7 10 * * A324A FF 00	Model Part No. A324A Cartridge FCV7-10 Cartridge Data Sheet Section H Cavity C-10-2
Flow Control & Check Meter Out A		FCV7 10 * * A314A FF 00	Model Part No. A314A Cartridge FCV7-10 Cartridge Data Sheet Section H Cavity C-10-2
Flow Control & Check Meter in B		FCV7 10 * * A324B FF 00	Model Part No. A324B Cartridge FCV7-10 Cartridge Data Sheet Section H Cavity C-10-2



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⚠ Caution

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Flow control functions

Function	Functional symbol	Model code	Housing kit
P T B A		FCV7 10 * * A314B FF 00	Model Part No. A314B Cartridge Cartridge Data Sheet FCV7-10 Cavity Section H C-10-2
Flow Control & Check Meter In A & B		FCV7 10 * * A324W FF 00 Refer to page L-22 for model code breakdown	Model Part No. A324W Cartridge Cartridge Data Sheet FCV7-10 qty 2 Cavity Section H C-10-2 qty 2
Flow Control & Check Meter Out A & B		FCV7 10 * * A314W FF 00 Refer to page L-22 for model code breakdown	Model Part No. A314W Cartridge Cartridge Data Sheet FCV7-10 qty 2 Cavity Section H C-10-2 qty 2
Flow Regulator Pressure Compensated and Check Meter in P		FAR1 10 * * A324P *** 00	Model Part No. A324P Cartridge Cartridge Data Sheet FAR1-10 Cavity Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter in A		FAR1 10 * * A314A *** 00	Model Part No. A314A Cartridge Cartridge Data Sheet FAR1-10 Cavity Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter Out A		FAR1 10 * * A324A *** 00	Hsg kit: model Part No. A324A Cartridge Cartridge Data Sheet FAR1-10 Cavity Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter in B		FAR1 10 * * A314B *** 00	Model Part No. A314B Cartridge Cartridge Data Sheet FAR1-10 Cavity Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter Out B		FAR1 10 * * A324B *** 00	Model Part No. A324B Cartridge Cartridge Data Sheet FAR1-10 Cavity Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter in A & B		FAR1 10 * * A314W A***B*** 00	Model Part No. A314W Cartridge Cartridge Data Sheet FAR1-10 qty 2 Cavity Section H C-10-2 qty 2

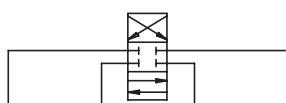


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Flow control & solenoid control functions

⚠ Caution

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Function	Functional symbol	Model code	Housing kit
Flow Regulator Pressure Compensated and Check Meter Out A & B		FAR1 10 * * A324W A***B*** 00	Model Part No. A324W Cartridge Cartridge Data Sheet 02-185351 Cavity Section H C-10-2 qty 2
Proportional Flow Control Pressure Compensation on P		EPV 10 * * A313P *** * * 00 Refer to page L-23 for model code breakdown	Model Part No. A313P Cartridge EPV-10, DPS2-10 Cartridge Data Sheet Section I & B Cavity C-10-2/C-10-3S
Solenoid 2 Way Poppet Type (P-T), N/C		SV3 10 * C A325P *** * 00	Model Part No. A325P Cartridge Cartridge Data Sheet 02-185352 Cavity Section A C-10-2
Solenoid 2 Way Poppet Type (P-T), N/O		SV3 10 * O A325P *** * 00	Model Part No. A325P Cartridge Cartridge Data Sheet 02-185352 Cavity Section A C-10-2
Solenoid 2 Way Spool type (P-T), N/C		SV4 10 * C A325P *** * 00	Model Part No. A325P Cartridge Cartridge Data Sheet 02-185352 Cavity Section A C-10-2
Solenoid 2 Way Spool Type (P-T), N/O		SV4 10 * O A325P *** * 00	Model Part No. A325P Cartridge Cartridge Data Sheet 02-185352 Cavity Section A C-10-2
Solenoid 2 Way Poppet Type Blocked on A Normally Closed		SV3 10 * C A324A *** * 00	Model Part No. A324A Cartridge Cartridge Data Sheet 02-185348 Cavity Section A C-10-2



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⚠ Caution

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Solenoid control functions

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



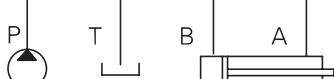
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Solenoid control functions

Caution

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

Function	Functional symbol	Model code	Housing kit
Spool Type Blocked On A & B Normally Closed		SV4 10 * C A324W **** * 00	Model Part No. A324W Cartridge Cartridge Data Sheet 02-185351 Cavity Section A SV4-10-C qty 2 C-10-2 qty 2
Spool Type Blocked on A & B Normally Open		SV4 10 * O A324W **** * 00	Model Part No. A324W Cartridge Cartridge Data Sheet 02-185351 Cavity Section A SV4-10-0 qty 2 C-10-2 qty 2
Poppet Type Load Holding On A Normally Closed		SV3 10 * C A314A **** * 00	Model Part No. A314A Cartridge Cartridge Data Sheet 02-185367 Cavity Section A SV3-10-C C-10-2
Poppet Type Load Holding on A Normally Open		SV3 10 * O A314A **** * 00	Model Part No. A314A Cartridge Cartridge Data Sheet 02-185367 Cavity Section A SV3-10-0 C-10-2
Poppet Type Load Holding on B Normally Closed		SV3 10 * C A314B **** * 00	Model Part No. A314B Cartridge Cartridge Data Sheet 02-185368 Cavity Section A SV3-10-C C-10-2
Poppet Type Load Holding on B Normally Open		SV3 10 * O A314B **** * 00	Model Part No. A314B Cartridge Cartridge Data Sheet 02-185368 Cavity Section A SV3-10-0 C-10-2
Poppet Type Load Holding on A & B Normally Closed		SV3 10 * C A314W **** * 00	Model Part No. A314W Cartridge Cartridge Data Sheet 02-185369 Cavity Section A SV3-10-C C-10-2 qty 2
Poppet Type Load Holding on A & B Normally Open		SV3 10 * O A314W **** * 00	Model Part No. A314W Cartridge Cartridge Data Sheet 02-185369 Cavity Section A SV3-10-0 qty 2 C-10-2 qty 2

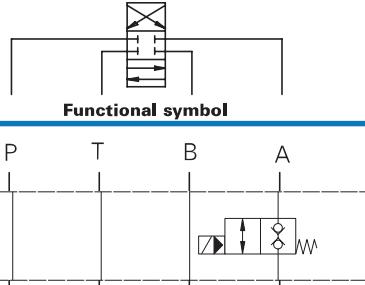
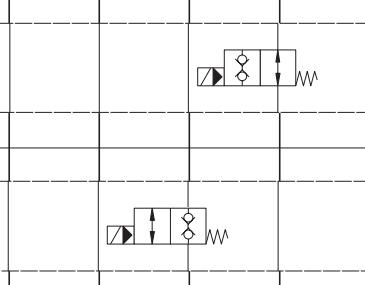
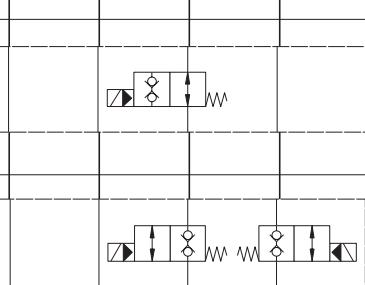
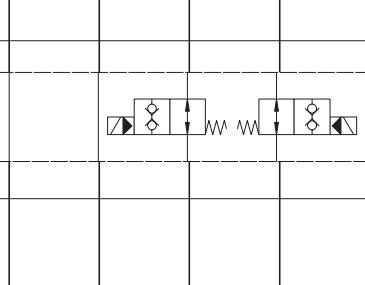
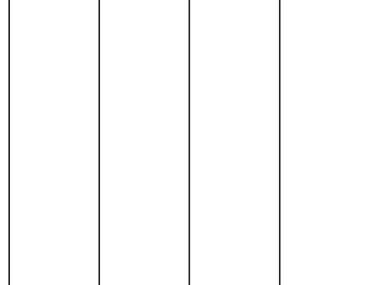
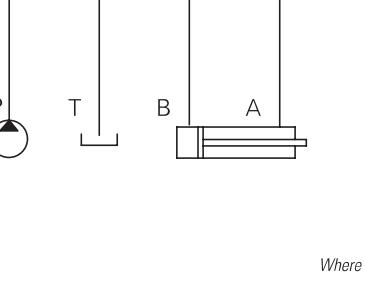


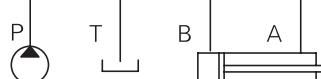
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⚠ Caution

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Solenoid control functions

Function	Functional symbol	Model code	Housing kit
Poppet Type Bi-Directional Load Holding on A Normally Closed		SBV11 10 * C A314A **** 00	Model Part No. A314A 02-185367 Cartridge Cartridge Data Sheet SBV11-10-C Cavity Section A C-10-2
Poppet Type Bi-Directional Load Holding on A Normally Open		SBV11 10 * O A314A **** 00	Model Part No. A314A 02-185367 Cartridge Cartridge Data Sheet SBV11-10-O Cavity Section A C-10-2
Poppet Type Bi-Directional Load Holding on B Normally Closed		SBV11 10 * C A314B **** 00	Model Part No. A314B 02-185368 Cartridge Cartridge Data Sheet SBV11-10-C Cavity Section A C-10-2
Poppet Type Bi-Directional Load Holding on B Normally Open		SBV11 10 * O A314B **** 00	Model Part No. A314B 02-185368 Cartridge Cartridge Data Sheet SBV11-10-O Cavity Section A C-10-2
Poppet Type Bi-Directional Load Holding on A & B Normally Closed		SBV11 10 * C A314W **** 00	Model Part No. A314W 02-185369 Cartridge Cartridge Data Sheet SBV11-10-C qty 2 Cavity Section A C-10-2 qty 2
Poppet Type Bi-Directional Load Holding on A & B Normally Open		SBV11 10 * O A314W **** 00	Model Part No. A314W 02-185369 Cartridge Cartridge Data Sheet SBV11-10-O qty 2 Cavity Section A C-10-2 qty 2

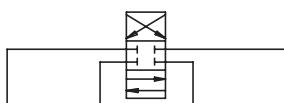


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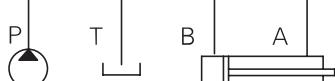
Solenoid control functions

Caution

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Function	Functional symbol	Model code	Housing kit
Poppet Type Unload A - T Normally Closed		SV3 10 * C A315A **** * 00	Model Part No. A315A Cartridge Cartridge Data Sheet 02-185370 Cavity Section A C-10-2
Poppet Type Unload A - T Normally Open		SV3 10 * O A315A **** * 00	Model Part No. A315A Cartridge Cartridge Data Sheet 02-185370 Cavity Section A C-10-2
Spool Type Unload A - T Normally Closed		SV4 10 * C A315A **** * 00	Model Part No. A315A Cartridge Cartridge Data Sheet 02-185370 Cavity Section A C-10-2
Spool Type Unload A - T Normally Open		SV4 10 * O A315A **** * 00	Model Part No. A315A Cartridge Cartridge Data Sheet 02-185370 Cavity Section A C-10-2
Poppet Type Unload B - T Normally Closed		SV3 10 * C A315B **** * 00	Model Part No. A315B Cartridge Cartridge Data Sheet 02-185371 Cavity Section A C-10-2
Poppet Type Unload B - T Normally Open		SV3 10 * O A315B **** * 00	Model Part No. A315B Cartridge Cartridge Data Sheet 02-185371 Cavity Section A C-10-2
Poppet Type Unload B - T Normally Closed		SV4 10 * C A315B **** * 00	Model Part No. A315B Cartridge Cartridge Data Sheet 02-185371 Cavity Section A C-10-2

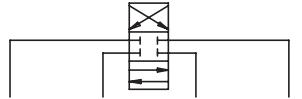
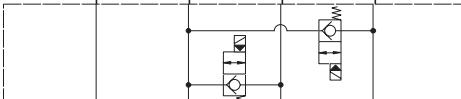
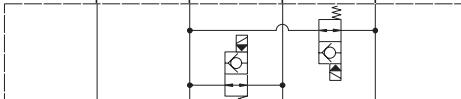
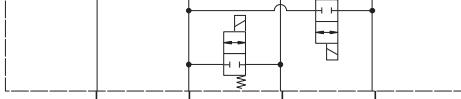
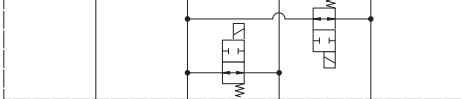
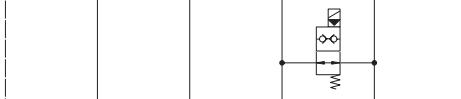


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⚠ Caution

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

Solenoid control functions

Function	Functional symbol	Model code	Housing kit
2 Way Spool Type Unload B - T Normally Open		SV4 10 * 0 A315B *** * 00	Model Part No. A315B Cartridge Cavity 02-185371 Cartridge Data Sheet SV4-10-0 Section A C-10-2
2 Way Poppet Type Unload A & B - T Normally Closed		SV3 10 * C A317T *** * 00	Model Part No. A317T Cartridge Cavity 02-185375 Cartridge Data Sheet 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	Model Part No. A317T Cartridge Cavity 02-185375 Cartridge Data Sheet SV3-10-O qty 2 Section A C-10-2 qty 2
2 Way Spool Type Unload A & B - T Normally Closed		SV4 10 * C A317T *** * 00	Model Part No. A317T Cartridge Cavity 02-185375 Cartridge Data Sheet 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	Model Part No. A317T Cartridge Cavity 02-185375 Cartridge Data Sheet SV4-10-O qty 2 Section A C-10-2 qty 2
Poppet Type Bi-Directional Blocked A - B & B - Normally Closed		SBV11 10 * C A318W *** * 00	Model Part No. A318W Cartridge Cavity 02-185376 Cartridge Data Sheet SBV11-10-C Section A C-10-2
Poppet Type Bi-Directional Blocked A - B & B - Normally Open		SBV11 10 * 0 A318W *** * 00	Model Part No. A318W Cartridge Cavity 02-185376 Cartridge Data Sheet SBV11-10-O Section A C-10-2



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Solenoid control & load control functions

Caution

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

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

Load control functions

Function	Functional symbol	Model code	Housing kit
Counterbalance Valve on A Pilot from B		1CE30- * A323A-** * *	Model Part No. A323A Cartridge Cartridge Data Sheet Cavity 6025820-001 1CE30 Section F A6610
Counterbalance Valve on B Pilot from A		1CE30- * A323B-** * *	Model Part No. A323B Cartridge Cartridge Data Sheet Cavity 6025821-001 1CE30 Section F A6610
Counterbalance Valve On A & B Cross Piloted		1CE30- * A323WA-** * */** *	Model Part No. A323W Cartridge Cartridge Data Sheet Cavity 6025822-001 1CE30 qty 2 Section F A6610 qty 2 Refer to page L-23 for model code breakdown

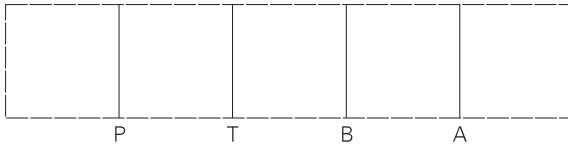
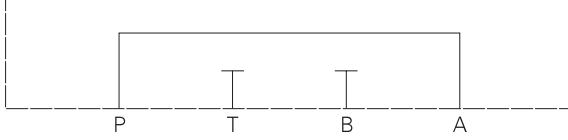
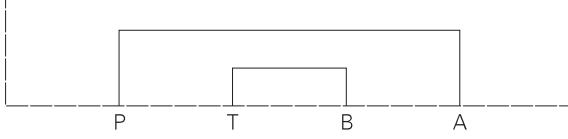
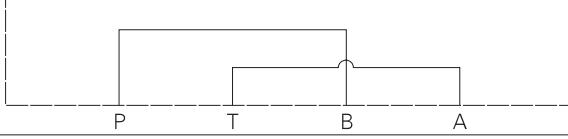
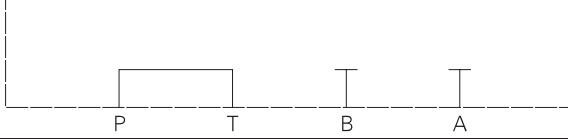
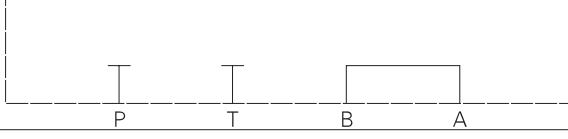
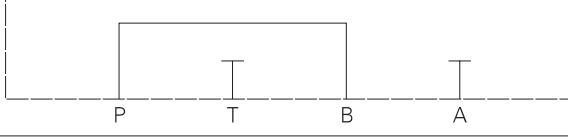
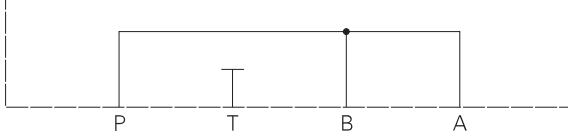
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Caution

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Note: O-Rings to be ordered separately.

Spacer/blanking/linking plates

Function	Functional symbol	Part number
Spacer Plate 10 mm (.39) Thick		Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Blanking Plate		02-185274 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Linking Plate P to A with B & T Blocked		02-185275 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Linking Plate P to A & B to T		02-185276 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Linking Plate P to B & A to T		02-185277 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Linking Plate P to T with A & B Blocked		02-185278 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Linking Plate A to B with P & T Blocked		02-185279 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Linking Plate P to B with A & T Blocked		02-185280 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282
Linking Plate P to A & B with T Blocked		02-185281 Buna N O-Ring Kit 02-184951 Viton O-Ring Kit 02-185282

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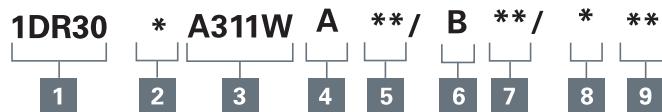
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Model codes

For sandwich valve assemblies with two valves

Model code	SRV	10	*	*	*	A322P	** / ****	***	*	**	
	1	2	3	4	5	6	7	8	9	10	11
1 Function	4 Style	6 Housing kit	9 Voltage range								
SRV - Solenoid actuated relief valve	C - Normally closed O - Normally open	A322P - Solenoid Relief Valve	12D - 24 VDC 24D - 24 VDC 115A - 115 VAC 230A - 230 VAC								
2 Size	5 Adjustment	7 Cracking pressure range	10 Connector type								
10 - 10 Size	C - Cap F - Fixed I - Internal K - Knob S - Screw	03 - 3,5-20 bar (50-300 psi) 35 - 17-240 bar (250-3500 psi)	G - ISO 4400 DIN 43650 P - 1/2" NPT conduit W - Leadwire								
3 Seals		8 Pressure setting	11 Special features								
N - Buna-N V - Viton®		User requested setting in psi	00 - None								
This Assembly includes an SV5-8 solenoid valve and an RV5-10 relief valve											
RV5A	10	*	*	*****	A	** / ****	B	** / ****	**		
1	2	3	4	5	6	7	8	9	10	11	12
1 Function	4 Adjustment	7 Cracking pressure range	10 Cracking pressure range								
SRV - Relief valve	C - Cap F - Fixed I - Internal K - Knob S - Screw	03 - 3,5-20 bar (50-300 psi) 20 - 7-140 bar (100-2000 psi) 35 - 7-240 bar (250-3500 psi)	03 - 3,5-20 bar (50-300 psi) 20 - 7-140 bar (100-2000 psi) 35 - 7-240 bar (250-3500 psi)								
2 Size	5 Housing kit	8 Pressure setting	11 Pressure setting								
10 - 10 Size	A312W - Dual A & B to T relief A321W - Cross port relief	User requested setting in psi	User requested setting in psi								
3 Seals		9 B Port acted upon	12 Special features								
N - Buna-N V - Viton®			00 - None								
RV3A	10	*	*	*****	A	** / ****	B	** / ****	**		
1	2	3	4	5	6	7	8	9	10	11	12
1 Function	4 Adjustment	7 Cracking pressure range	10 Cracking pressure range								
RV3 - Relief valve	C - Cap F - Fixed I - Internal K - Knob S - Screw	03 - 3,5-20 bar (50-300 psi) 09 - 7-62 bar (100-900 psi) 18 - 7-124 bar (250-1800 psi) 36 - 35-250 bar (500-3600 psi)	03 - 3,5-20 bar (50-300 psi) 09 - 7-62 bar (100-900 psi) 18 - 7-124 bar (250-1800 psi) 35 - 35-250 bar (500-3600 psi)								
2 Size	5 Housing kit	8 Pressure setting	11 Pressure setting								
10 - 10 Size	A312W - Dual A & B to T relief A321W - Cross port relief	User requested setting in psi	User requested setting in psi								
3 Seals		9 B port acted upon	12 Special features								
N - Buna-N V - Viton®			00 - None								

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

**1 Function**

1DR30 - Relief valve

2 Adjustment

P - Leakproof screw
 R - Handknob
 G - Tamperproof cap

3 Housing kit**4 A Port acted upon****5 Cracking pressure range**

Note: Code based on pressure in bar.

- 10** - 7-100 bar
 Standard setting 70 bar
- 20** - 35-210 bar
 Standard setting 100 bar
- Standard setting made at 4.8 L/min.

6 B Port acted upon**7 Cracking pressure**

Note: Code based on pressure in bar.

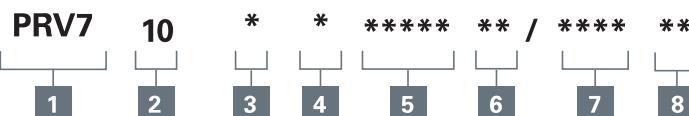
- 10** - 7-100 bar
 Standard setting 70 bar
- 20** - 35-210 bar
 Standard setting 100 bar
- Standard setting made at 4.8 L/min.

8 Seals

S - Buna-N
 SV - Viton®

9 Special features

00 - None

**1 Function**

PSV2 - Pressure reducing valve

2 Size

10 - 10 Size

3 Seals

N - Buna-N
 V - Viton®

4 Adjustment

C - Cap
 F - Fixed
 I - Internal
 K - Knob
 S - Screw

5 Housing kit**6 Cracking pressure range**

- 02** - 3,5-10 bar (50-150 psi)
03 - 5-20 bar (75-300 psi)
05 - 7-30 bar (100-450 psi)
10 - 14-65 bar (200-950 psi)
18 - 20-125 bar (300-1800 psi)

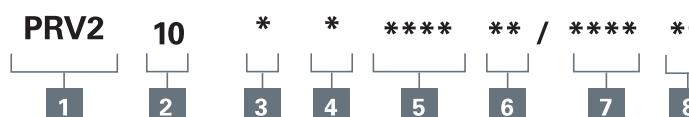
7 Pressure setting

User requested setting in psi

Note: The other cartridge used in this assembly is a CV3-10-P-020

8 Special features

00 - None

**1 Function**

PSV2 - Pressure reducing valve

2 Size

10 - 10 Size

3 Seals

N - Buna-N
 V - Viton®

4 Adjustment

C - Cap
 F - Fixed
 I - Internal
 K - Knob
 S - Screw

5 Housing kit

- 6 Cracking pressure range**
- 03** - 3,5-20 bar (50-300 psi)
20 - 7-140 bar (100-2000 psi)
36 - 17-240 bar (250-3500 psi)

7 Pressure setting

User requested setting in psi

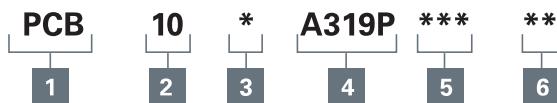
8 Special features

00 - None

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model codes

For sandwich valve assemblies with two valves



1 Function

PCB - Pressure compensator, bypass

2 Size

10 - 10 Size

3 Seals

N - Buna-N
V - Viton®

4 Housing kit

5 Differential pressure

(of DPS2-10-P-F cartridge)

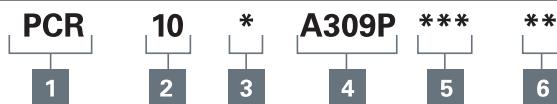
- 005** - 0,3 bar (5 psi)
- 010** - 0, 7 bar (10 psi)
- 020** - 1, 38 bar (20 psi)
- 040** - 2, 75 bar (40 psi)
- 080** - 5, 5 bar (80 psi)
- 160** - 11,0 bar (160 psi)

6 Special features

00 - None

Note: The operating back pressure at port 3 (at A & B) must never be less than 1.3 times the spring set pressure.

The other cartridge used in the assembly is a DSV2-8-B-0.



1 Function

PCR - Pressure compensator, restrictive

2 Size

10 - 10 Size

3 Seals

N - Buna-N
V - Viton®

4 Housing kit

5 Differential pressure

(of DPS2-10-P-F cartridge)

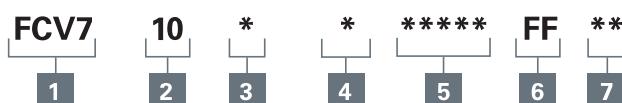
- 005** - 0,3 bar (5 psi)
- 010** - 0, 7 bar (10 psi)
- 020** - 1, 38 bar (20 psi)
- 040** - 2, 75 bar (40 psi)
- 080** - 5, 5 bar (80 psi)
- 160** - 11,0 bar (160 psi)

6 Special features

00 - None

Note: The operating back pressure at port 3 (at A & B) must never be less than 1.3 times the spring set pressure.

The other cartridge used in the assembly is a DSV2-8-B-0.



1 Function

FCV7 - Flow control valve

3 Seals

N - Buna-N
V - Viton®

5 Housing kit

A314W - Meter out
A324W - Meter in

7 Special features

00 - None

2 Size

10 - 10 Size

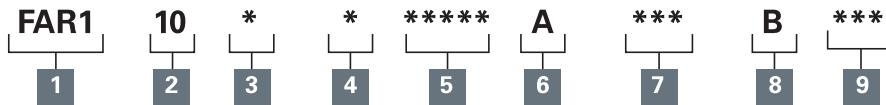
4 Adjustment

C - Cap
F - Fixed
K - Knob
S - Screw

6 Control flow option

FF - Needle valve with free reverse flow

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

**1 Function**

FAR1 - Fully adjustable flow regulator

2 Size

10 - 10 Size

3 Seals

N - Buna-N
V - Viton®

4 Adjustment

H - Calibrated handknob with locknut

K - Handknob with locknut

S - Screw with locknut

6 A port acted upon**7 Factory set flow rate**

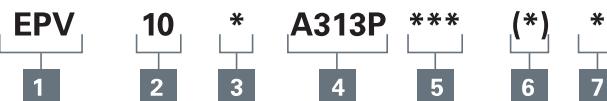
Specify in tenths of a gallon per minute, i.e. 025=2.5 USgpm

8 B port acted upon**9 Factory set flow rate**

Specify in tenths of a gallon per minute, i.e. 025=2.5 USgpm

5 Housing kit

A314W - Meter in
A324W - Meter out

**1 Function**

EPV - Proportional flow control

2 Size

10 - 10 Size

3 Seals

N - Buna-N
V - Viton®

4 Housing kit

5 Voltage range
12D - 24 VDC
24D - 24 VDC

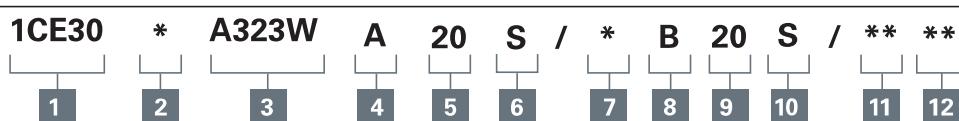
7 Coil connector type

F - Weatherpack
Q - Spade terminals
U - DIN 43650
W - Leadwire
Y - Metri-pak

Note: The other cartridge used in the assembly is a DPS2-10-F-F-0-160

6 Manual override option

Blank - No manual override
M - Pin type
S - Screw type

**1 Pilot ratio/function**

1CE30 - Overcenter

2 Adjustment

F - Screw
N - Fixed

3 Housing kit**5 Pressure range**

20 - (25:1 & 5:1) 70-210 bar.
Standard setting 100 bar (10:1) 100-210 bar.
Setting made at 4.8 L/min.

8 B port acted upon**6 Seals**

S - Buna-N
SV - Viton®

9 Pressure range

20 - (25:1 & 5:1) 70-210 bar.
Standard setting 100 bar (10:1) 100-210 bar.
Standard setting 100 bar.
Setting made at 4.8 L/min.

11 Pilot ratio

2- 2.5:1
5- 5:1 (Standard)
10- 10:1

4 A port acted upon

7 Pilot ratio
2- 2.5:1
5- 5:1 (Standard)
10- 10:1

10 Seals

S - Buna-N
SV - Viton®

12 Special features

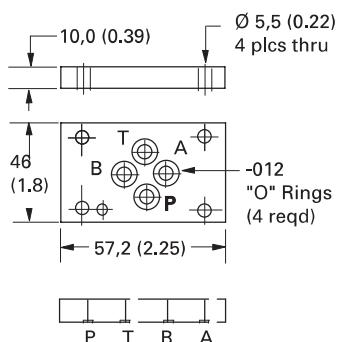
00 - None

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

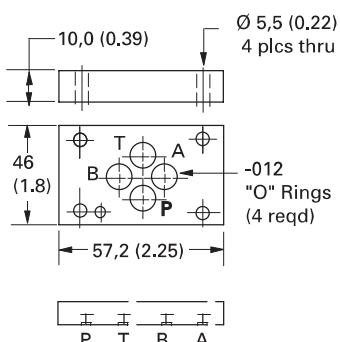
Dimensions

Spacer, blanking & linking plates

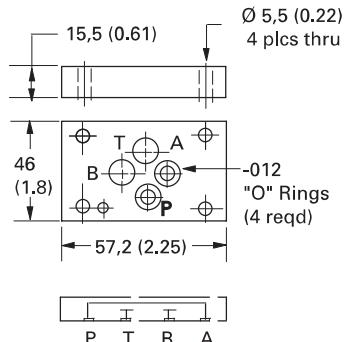
Spacer plate
02-185273



Blanking plate
02-185274

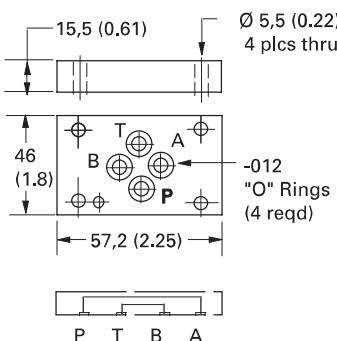


Linking plate
02-185275



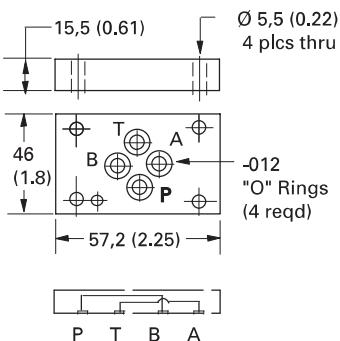
P to A with B & T blocked

Linking plate
02-185276



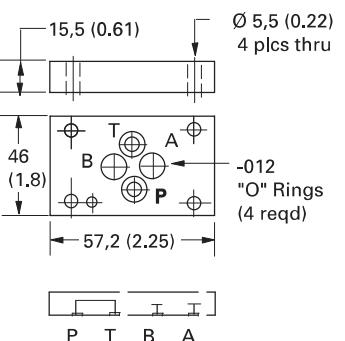
P to A with B & T

Linking plate
02-185277



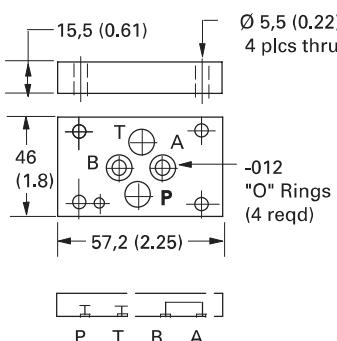
P to B with A & T

Linking plate
02-185278



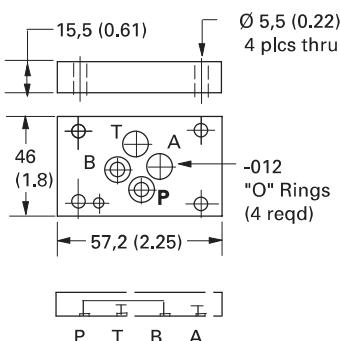
P to T with B & A blocked

Linking plate
02-185279



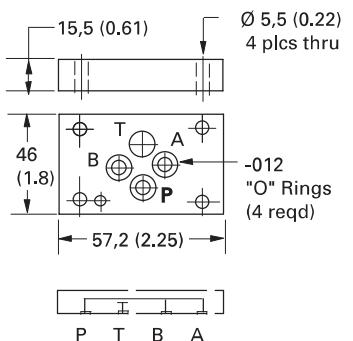
A to B with P & T blocked

Linking plate
02-185280



P to B with A & T blocked

Linking plate
02-185281

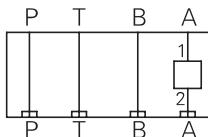


P to A & B with T blocked

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

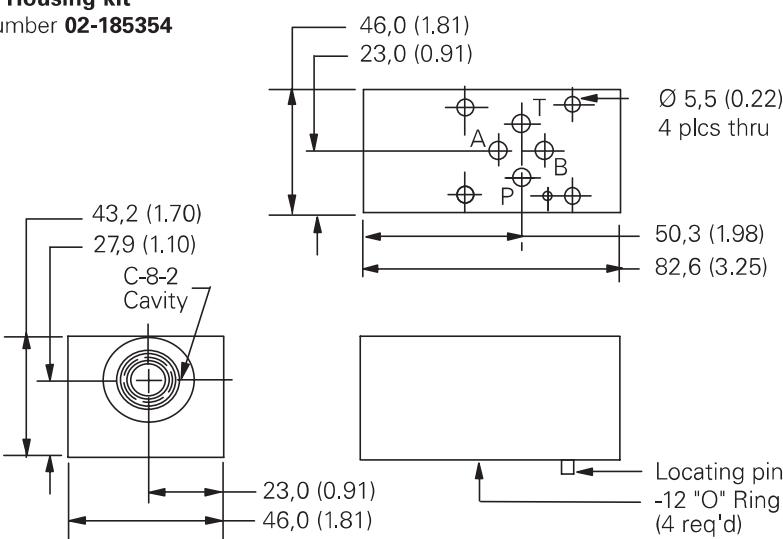
Dimensions

mm (inch)

Cavity porting

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

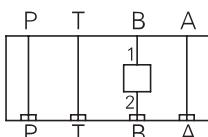
A307A Housing kit
Part Number **02-185354**

**Typical cartridges**

CV3-8

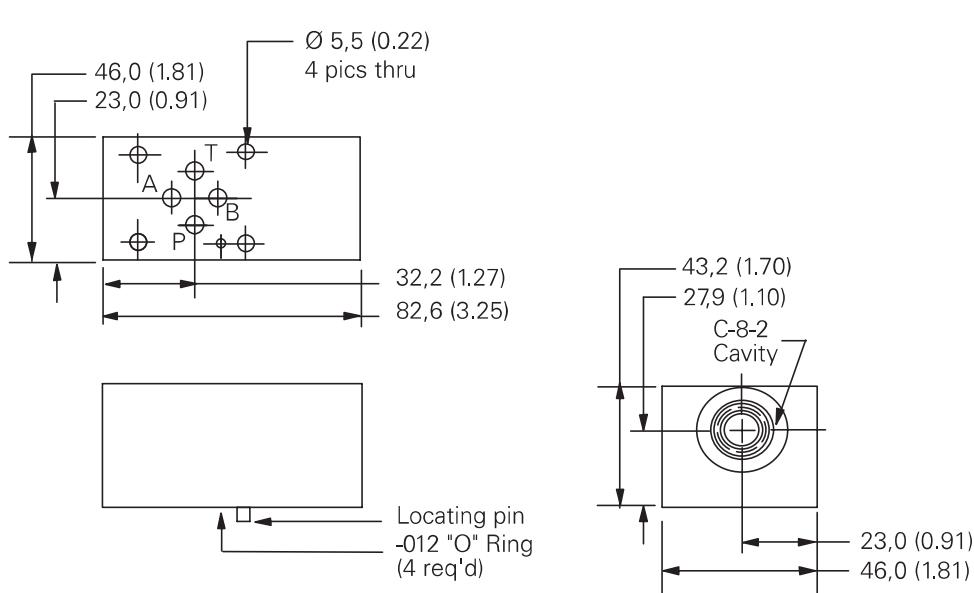
Function

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**

CV3-8

Function

Check valve on B, Free flow out

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

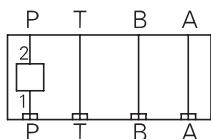
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

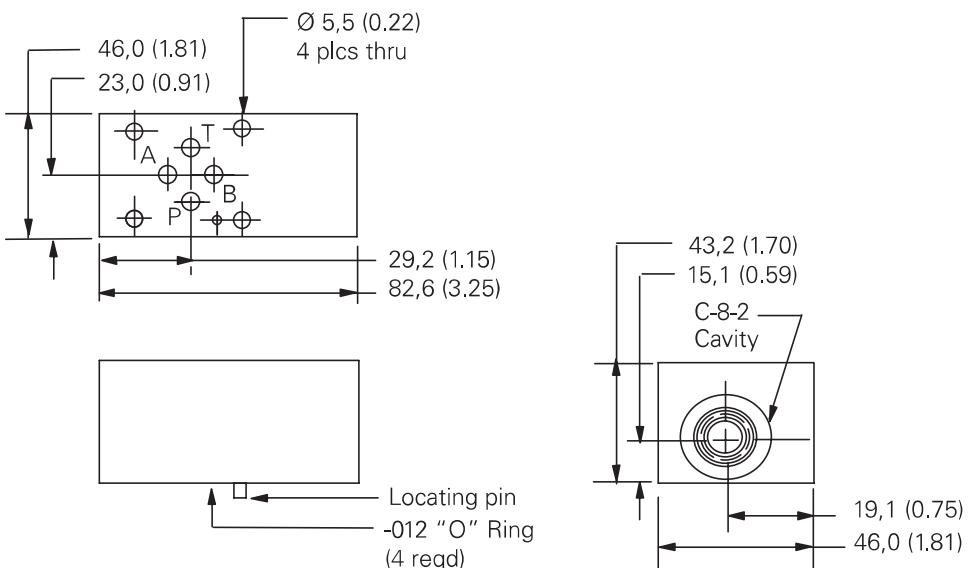
mm (inch)

Cavity porting



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

A307P Housing Kit
Part Number **02-185356**



Typical cartridges

CV3-8

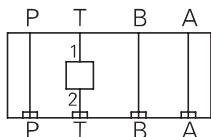
Function

Check valve on P

Dimensions

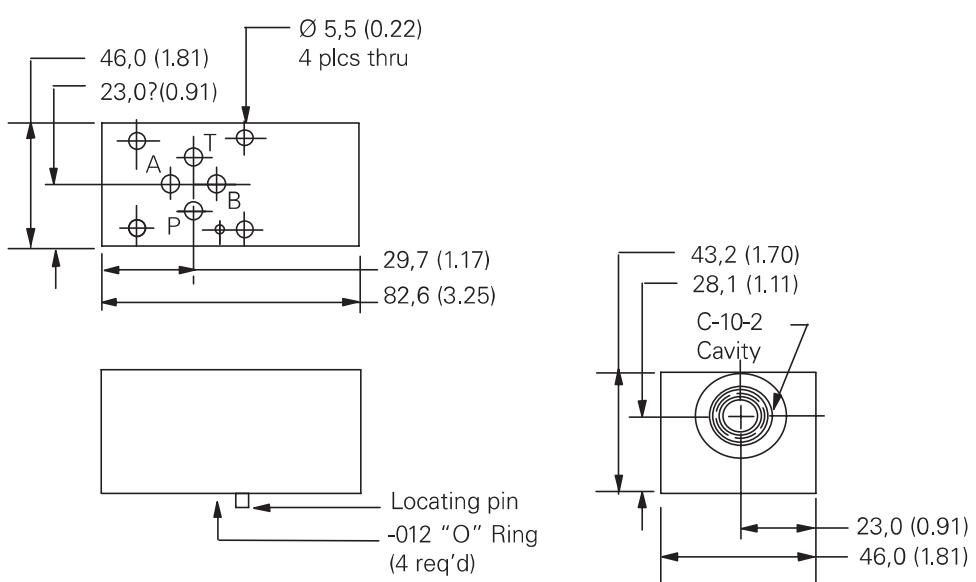
mm (inch)

Cavity porting



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

A308T Housing kit
Part Number **02-185360**



Typical cartridges

CV3-10

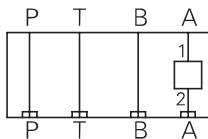
Function

Check valve on T

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

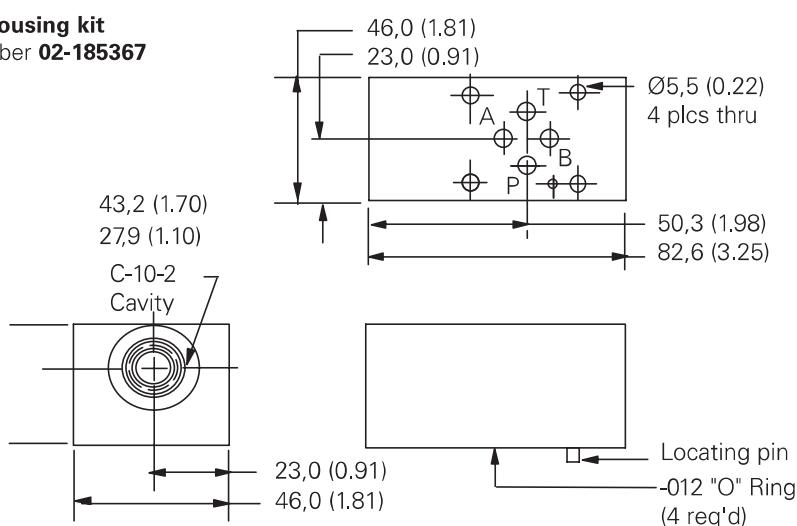
mm (inch)

Cavity porting

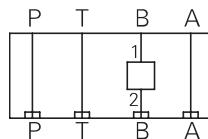
Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

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

A314A Housing kit
Part Number **02-185367**

**Typical cartridges****Function**

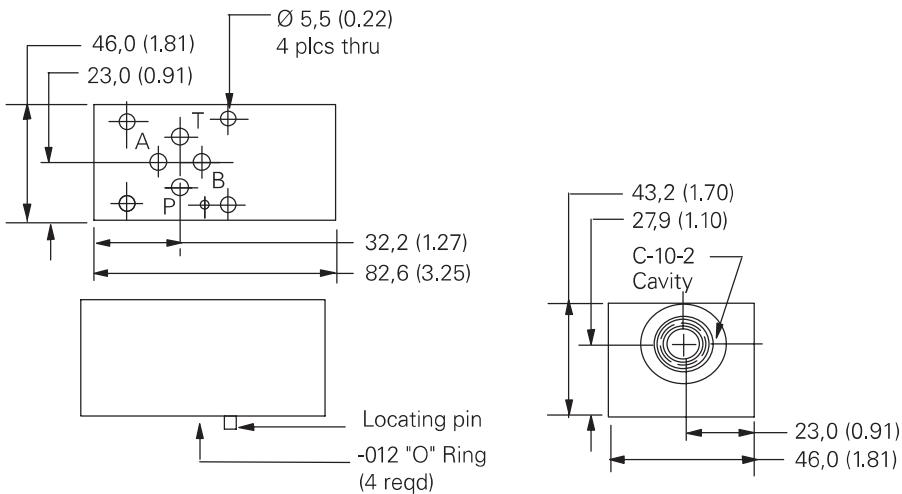
CV3-10-P	Check valve on A, free flow out
FAR1-10	Flow regulator, pressure compensated and check, Meter in A
FCV7-10	Flow control and check, Meter out A
SBV11-10-C	Solenoid 2-way poppet type bi-directional load holding on A, normally closed
SBV11-10-O	Solenoid 2-way poppet type bi-directional load holding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

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.

A314A housing kit
Part Number **02-185368**

**Typical cartridges****Function**

CV3-10 *-P	Check valve on B, free flow out
FAR1-10	Flow regulator, pressure compensated and check, Meter in 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

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

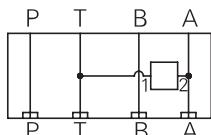
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

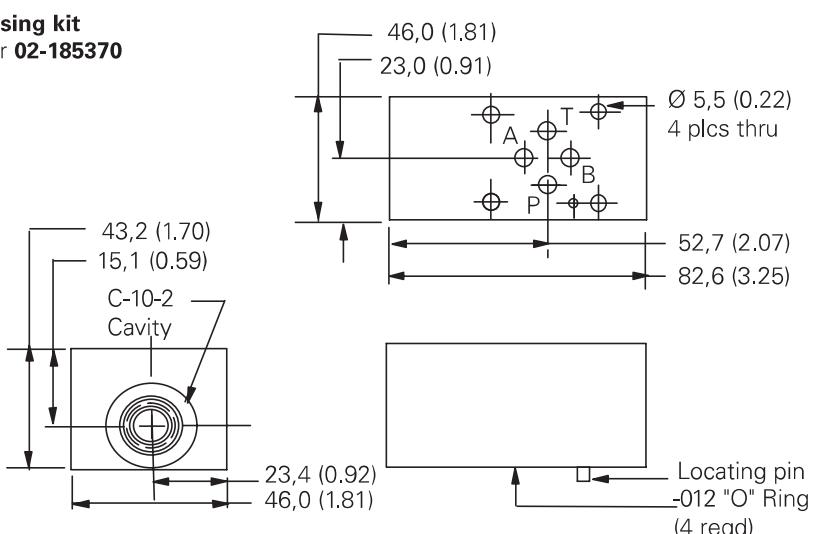
Cavity porting



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.

A315A Housing kit
Part Number **02-185370**

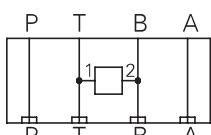


Typical cartridges

Function

SV3-10-C	Solenoid 2-way poppet type unload A-T normally closed
SV3-10-0	Solenoid 2-way poppet type unload A-T normally open
SV4-10-C	Solenoid 2-way spool type unload A-T normally closed
SV4-10-0	Solenoid 2-way spool type unload A-T normally open

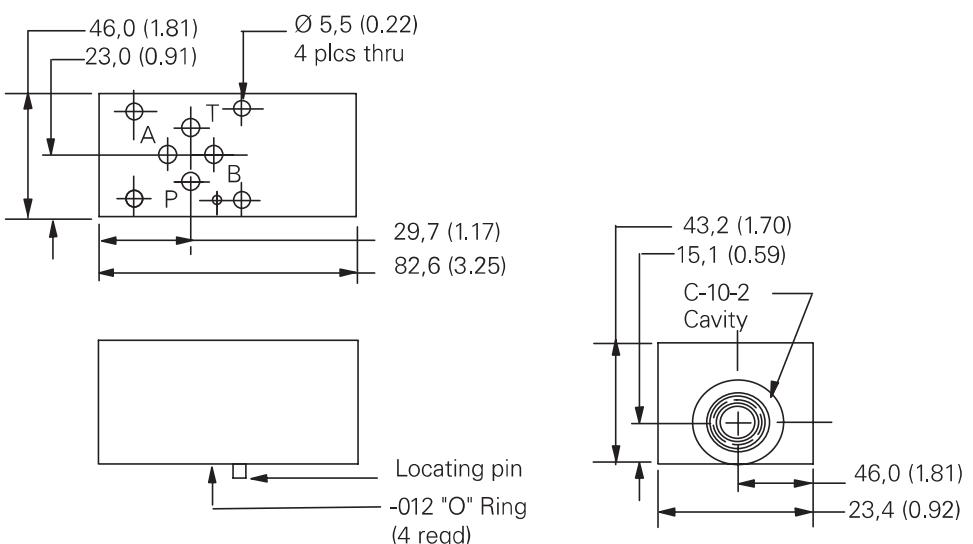
Cavity porting



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.

A315B Housing kit
Part Number **02-185371**



Typical cartridges

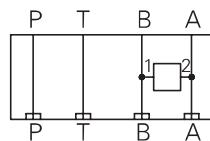
Function

SV3-10-C	Solenoid 2-way poppet type unload B-T normally closed
SV3-10-0	Solenoid 2-way poppet type unload B-T normally open
SV4-10-C	Solenoid 2-way spool type unload B-T normally closed
SV4-10-0	Solenoid 2-way spool type unload B-T normally open

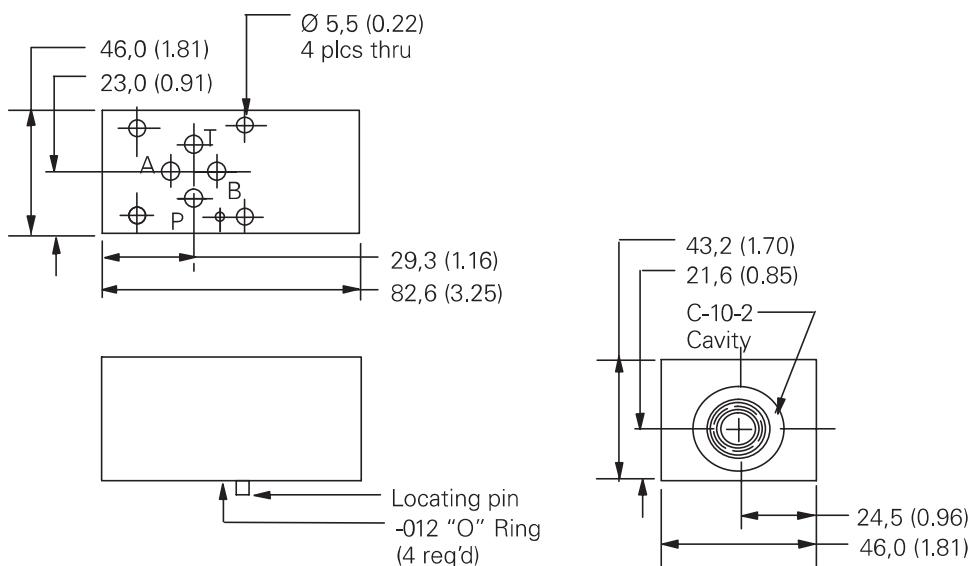
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

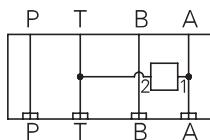
mm (inch)

Cavity porting

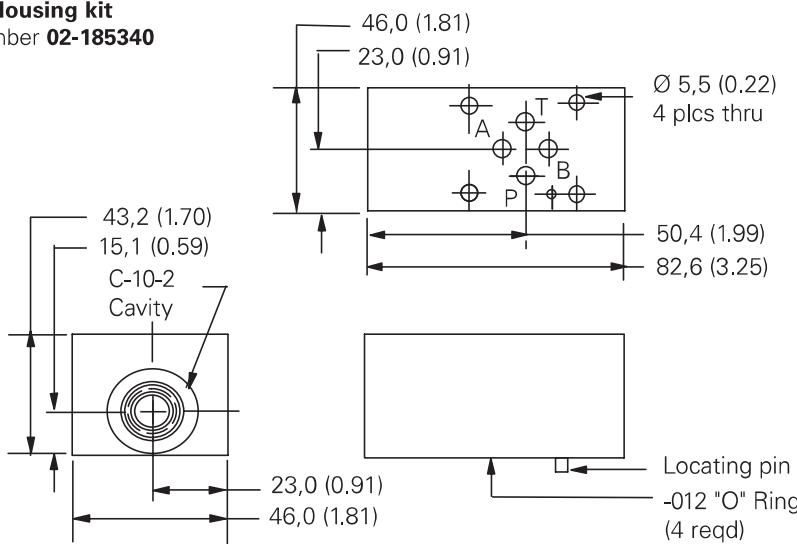
Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

A318W Housing kit
Part Number **02-185376**
**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

Cavity porting

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

A321A Housing kit
Part Number **02-185340**


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

Typical cartridges**Function**

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

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

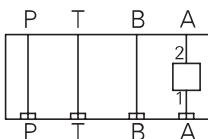
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

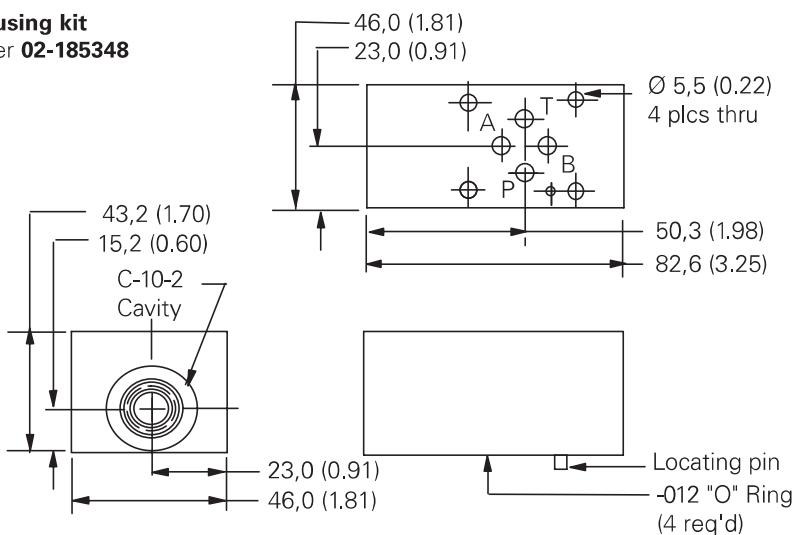
Cavity porting



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.

A324A Housing kit
Part Number **02-185348**

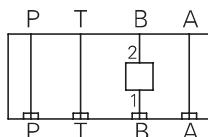


Typical cartridges

Function

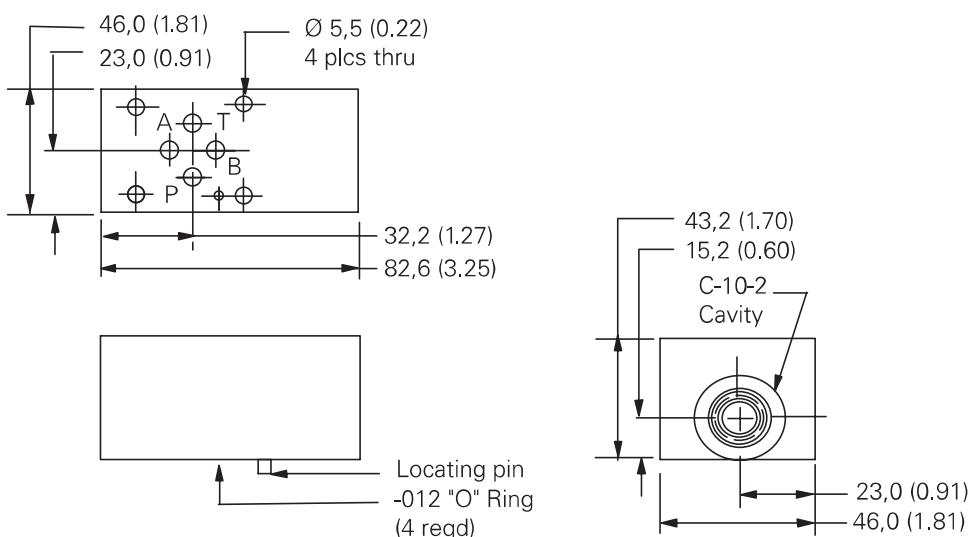
FAR1-10	Flow regulator pressure compensated and check, meter out A
FCV7-10	Flow control and check, meter in A
SV3-10-C	Solenoid 2-way poppet type blocking on A, normally closed
SV3-10-0	Solenoid 2-way poppet type blocking on A, normally open
SV4-10-C	Solenoid 2-way spool type blocking on A, normally closed
SV4-10-0	Solenoid 2-way spool type blocking on A, normally open

Cavity porting



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

A324B Housing kit
Part Number **02-185349**



Typical cartridges

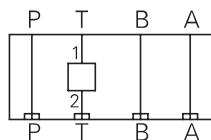
Function

FAR1-10	Flow regulator pressure compensated and check, meter out B
FCV7-10	Flow control and check, meter in B
SV3-10-C	Solenoid 2-way poppet type blocking on B, normally closed
SV3-10-0	Solenoid 2-way poppet type blocking on B, normally open
SV4-10-C	Solenoid 2-way spool type blocking on B, normally closed
SV4-10-0	Solenoid 2-way spool type blocking on B, normally open

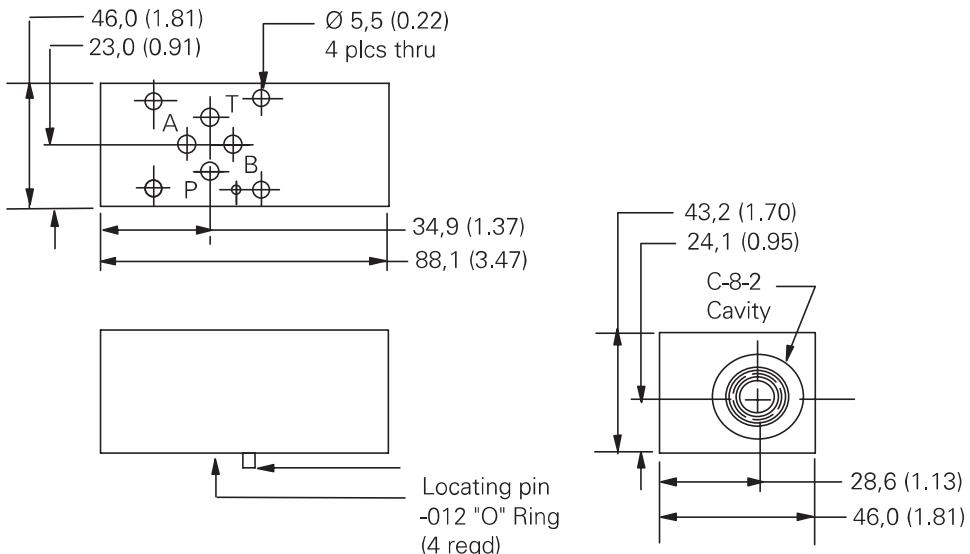
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

mm (inch)

Cavity porting

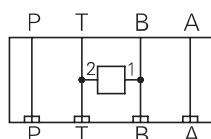
Torque cartridge in housing
34-40 Nm (25-30 ft. lbs)

A307T Housing kit
Part Number **02-185357**
**Typical cartridges**

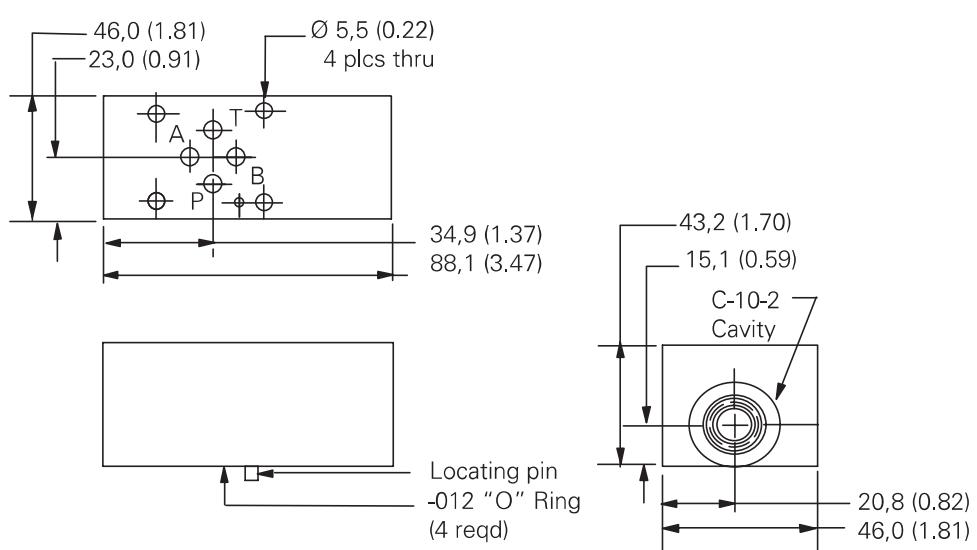
CV3-8

Function

Check valve on T

Cavity porting

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

A321B Housing kit
Part Number **02-185341**
**Typical cartridges**

ERV1-10

Function

Proportional relief valve B-T

RV1-10

Relief valve B-T

RV5-20

Relief valve B-T

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

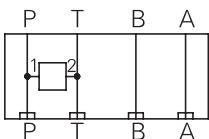
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

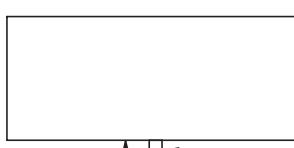
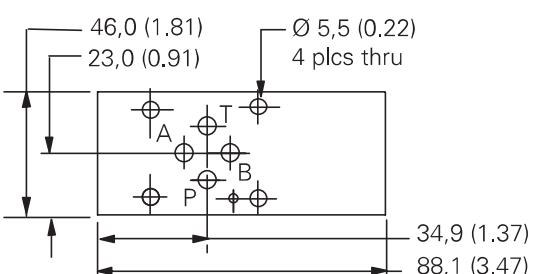
Cavity porting



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.

A321P Housing kit
Part Number **02-185342**



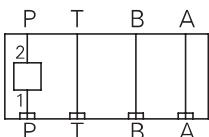
Locating pin
-012 "O" Ring
(4 reqd)

Typical cartridges

Function

CV16-10-P-0-5	Anti-cavitation check P-T
ERV1-10	Proportional relief valve P-T
RV1-10	Relief valve P-T
RV5-10	Relief valve P-T

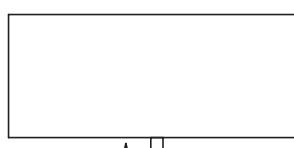
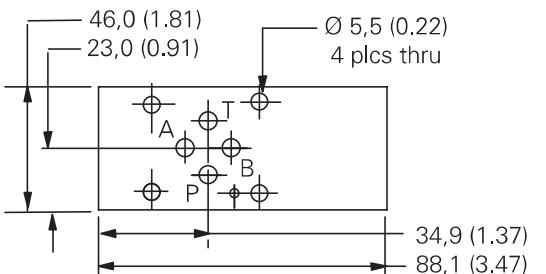
Cavity porting



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.

A324P Housing kit
Part Number **02-185350**



Locating pin
-012 "O" Ring
(4 reqd)

Typical cartridges

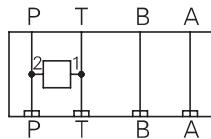
Function

CV3-10	Check valve on P
FAR1-10	Flow regulator pressure compensated, meter in P
NV1-10	Flow control, meter in P

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

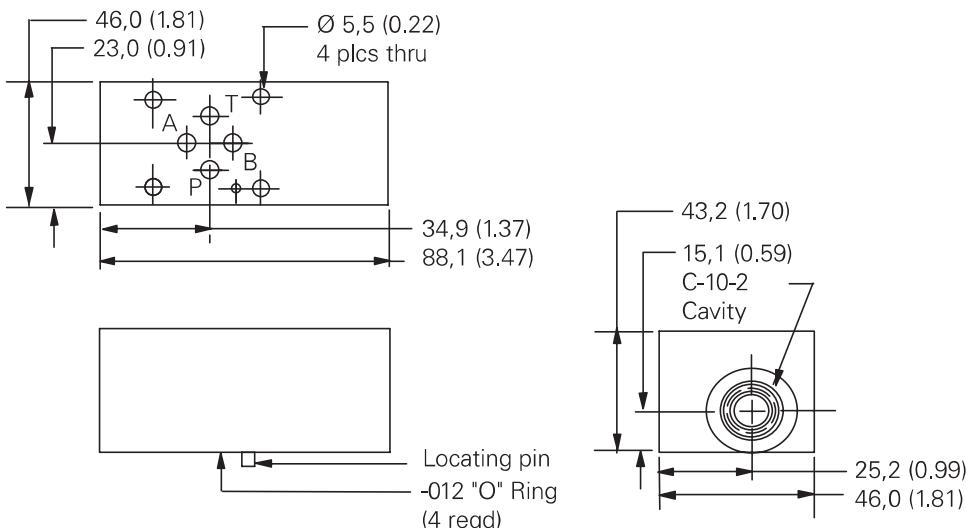
Dimensions

mm (inch)

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.

A325P Housing kit
Part Number **02-185352****Typical cartridges****Function**

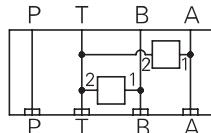
SV3-10-C	Solenoid 2-way poppet type P-T, normally closed
SV3-10-O	Solenoid 2-way poppet type P-T, normally open
SV4-10-C	Solenoid 2-way spool type P-T, normally closed
SV4-10-O	Solenoid 2-way spool type P-T, normally open

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

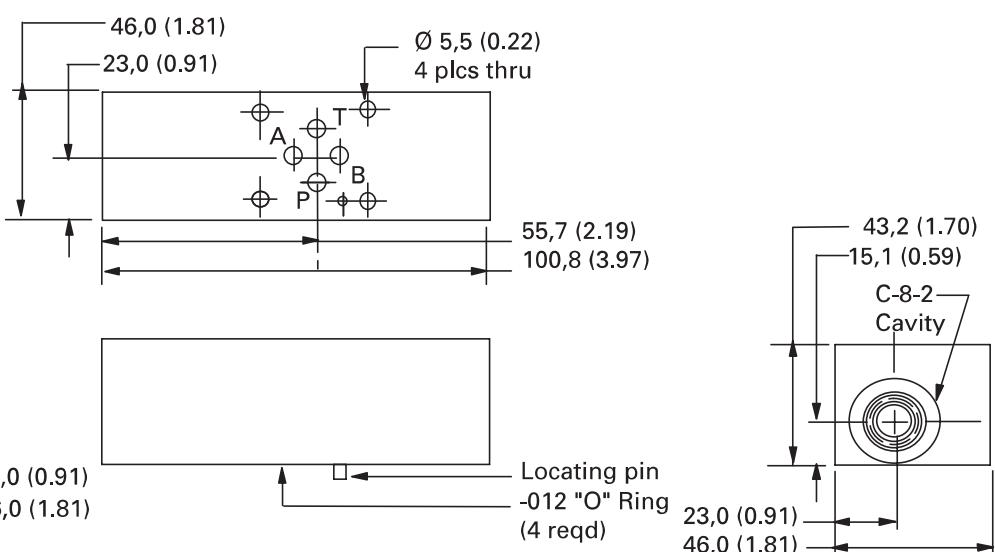
ISO 4401-03/CETOP03 Housing kits

Cavity porting



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

A311W Housing kit
Part Number **02-185364**



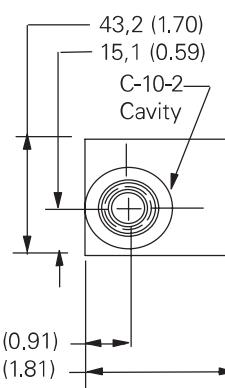
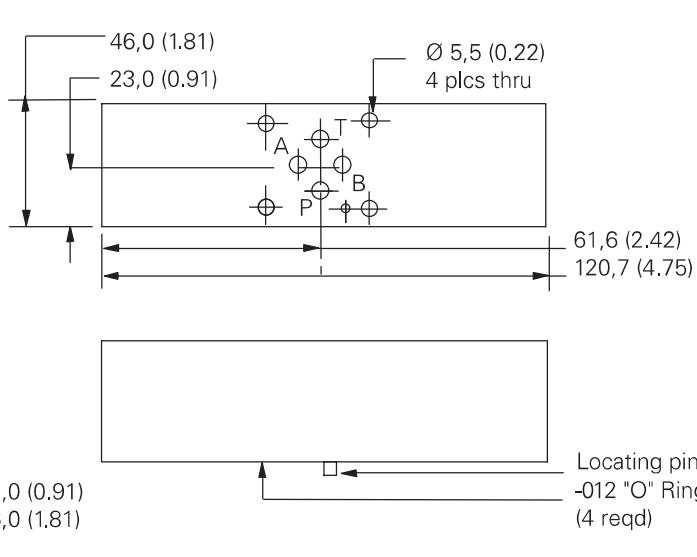
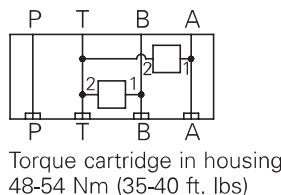
Typical cartridges	Function
1DR30	Dual relief valve A-T, B-T

L

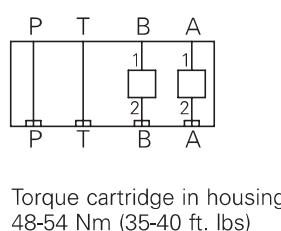
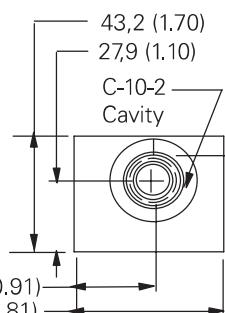
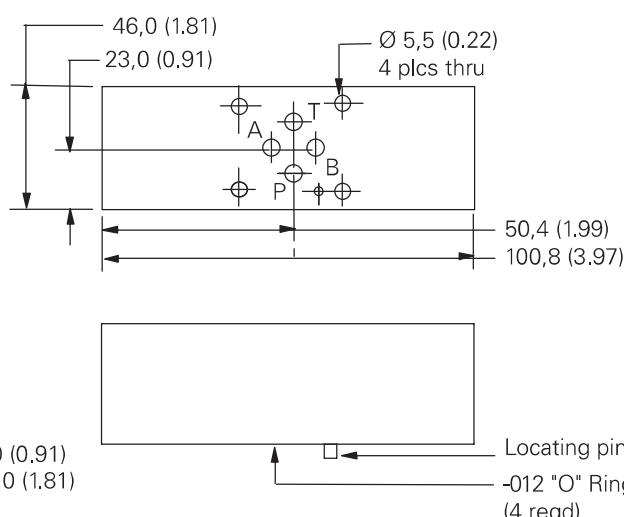
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

mm (inch)

A312W Housing kit
Part Number 02-185365**Cavity porting**

Typical cartridges	Function
RV1-10	Dual relief valve A-T, B-T
RV5-10	Dual relief valve A-T, B-T

Cavity porting**A314W Housing kit**
Part Number 02-185369

Typical cartridges	Function
FAR1-10	Flow regulator pressure compensated and check, meter in 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

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

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

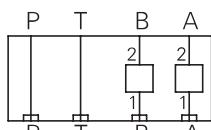
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

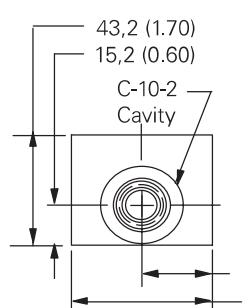
Cavity porting



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

A324W Housing kit

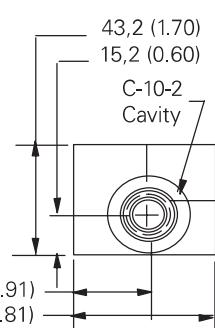
Part Number **02-185351**



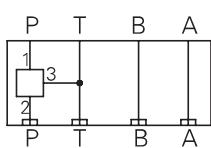
Typical cartridges

Function

FAR1-10	Flow regulator pressure compensated and check, meter out 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
SV3-10-0	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
SV4-10-0	Solenoid 2-way spool type blocking on A & B normally open



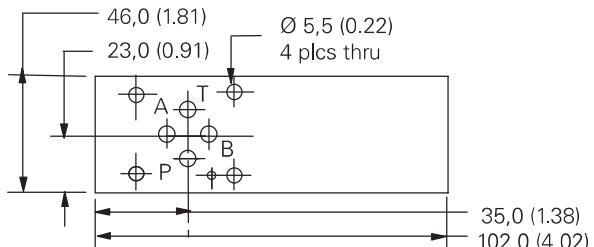
Cavity porting



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

A326P Housing kit

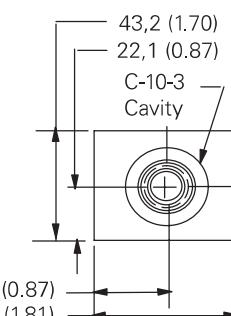
Part Number **02-185353**



Typical cartridges

Function

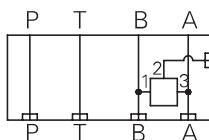
MRV3-10-K-0	Manual rotary selector on P
PRV2-10	Reducing valve (P) drained to T
SV1-10-3	Solenoid 3-way selector on P
SV4-10-3	Solenoid 3-way selector on P



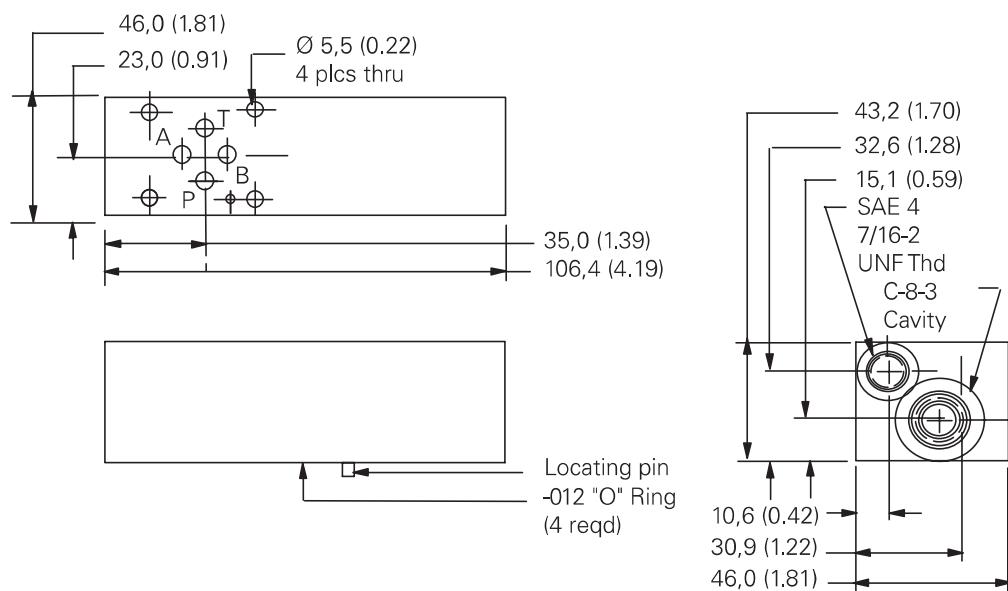
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

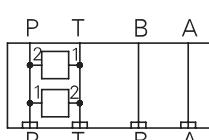
mm (inch)

Cavity porting

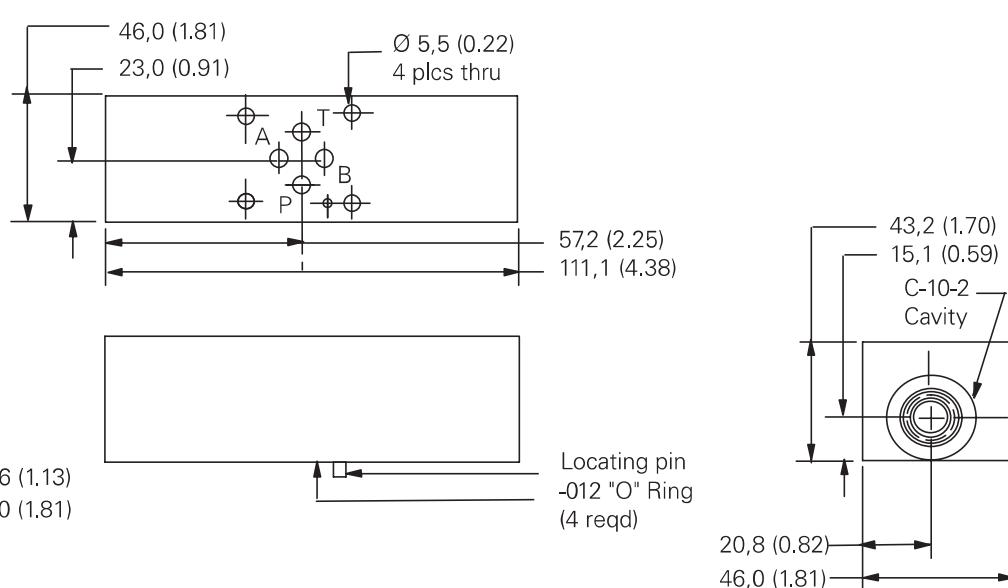
Torque cartridge in housing
34-40 Nm (25-30 ft. lbs)

A309W Housing kit
Part Number **02-185361**


Typical cartridges	Function
DSV2-8-B-0	Shuttle valve A & B Output external

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)

A322P Housing kit
Part Number **02-185344**


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

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

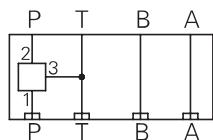
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

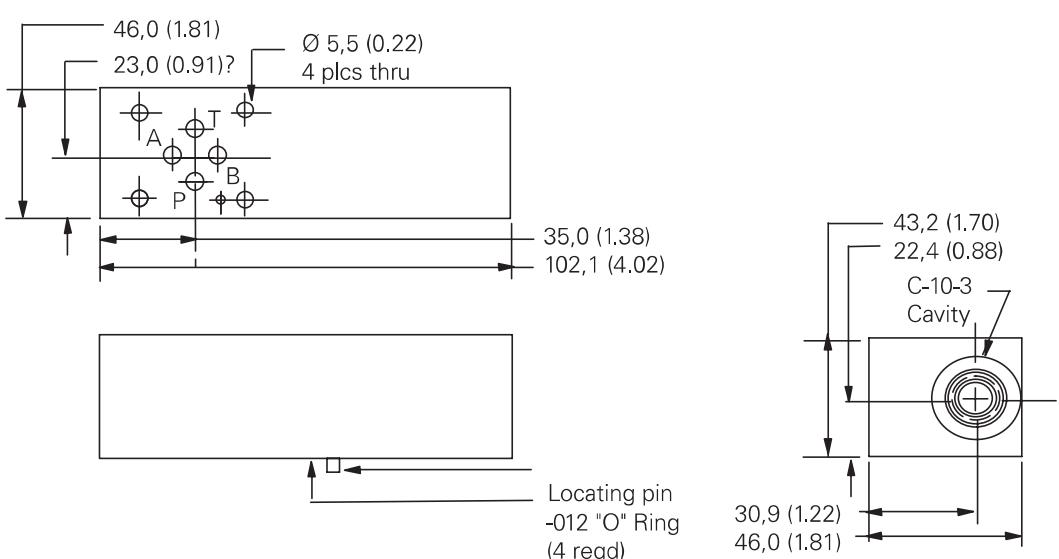
mm (inch)

Cavity porting



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

A316P Housing kit
Part Number **02-185374**



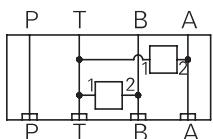
Typical cartridges

PSV7-10

Function

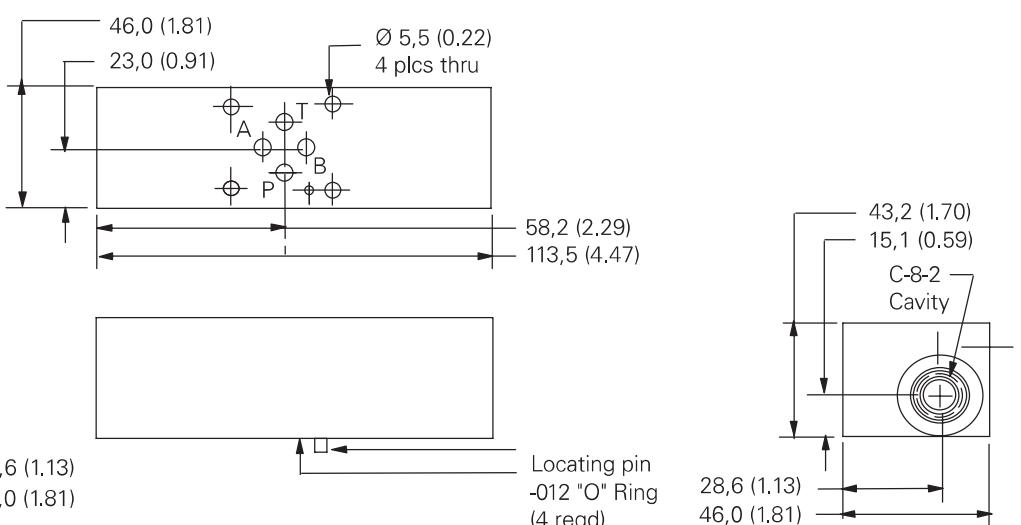
Sequence valve in to P

Cavity porting



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

A320T Housing kit
Part Number **02-185379**



Typical cartridges

CV3-8

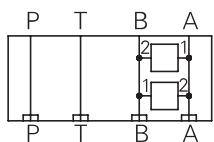
Function

Check valve on T to A & B

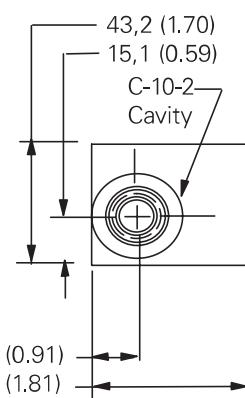
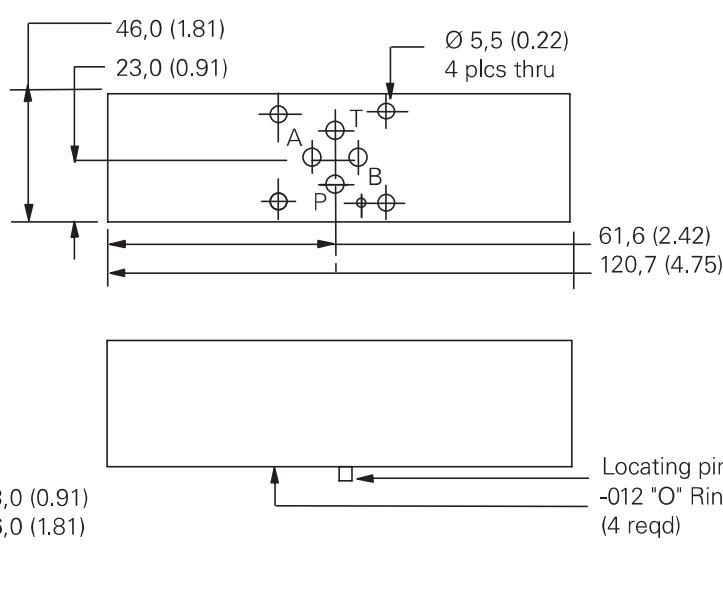
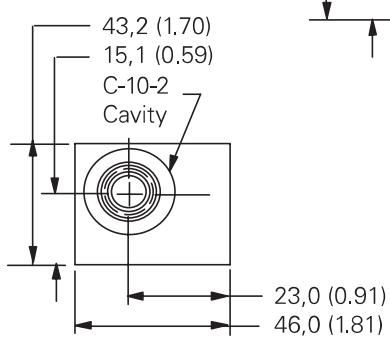
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

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

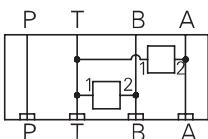
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

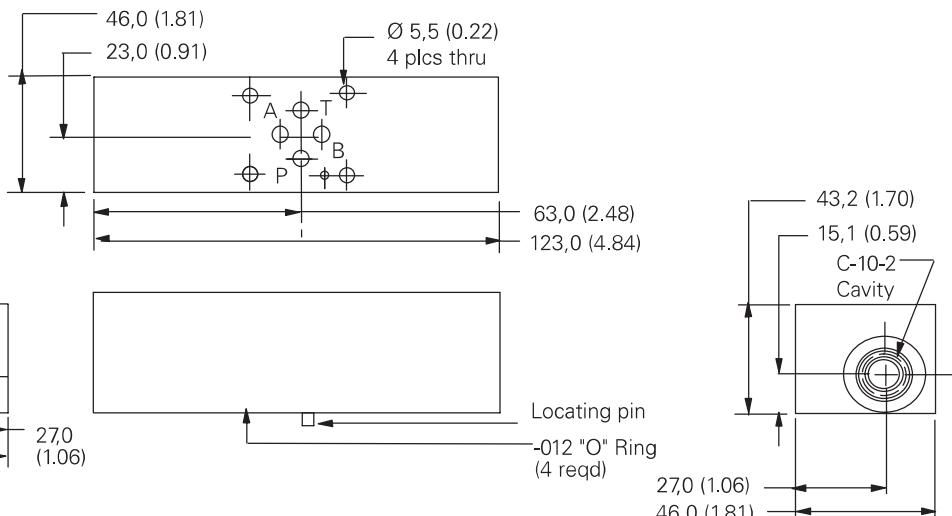
mm (inch)

Cavity porting



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

A317A Housing kit
Part Number **02-185375**

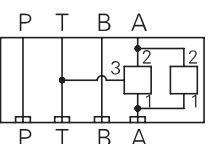


Note: This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

Typical cartridges

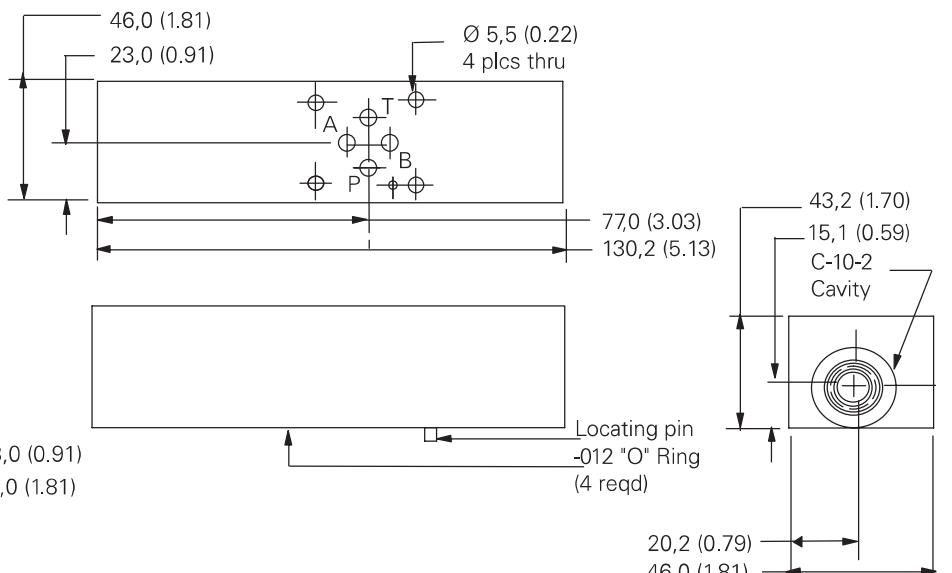
	Function
CV3-10	Check valve on T to A & B
SV3-10-C	Solenoid 2-way poppet type unload A & B-T, normally closed
SV3-10-O	Solenoid 2-way poppet type unload A & B-T, normally open
SV4-10-C	Solenoid 2-way spool type unload A & B-T, normally closed
SV4-10-O	Solenoid 2-way spool type unload A & B-T, normally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

Cavity porting



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

A310A Housing kit
Part Number **02-185362**



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

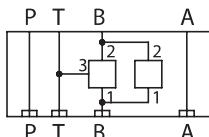
Typical cartridges

	Function
PRV2-10 & CV3-10-P-3	Reducing on A drained to T reverse free flow check

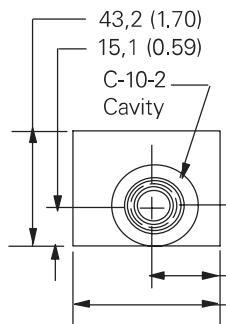
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

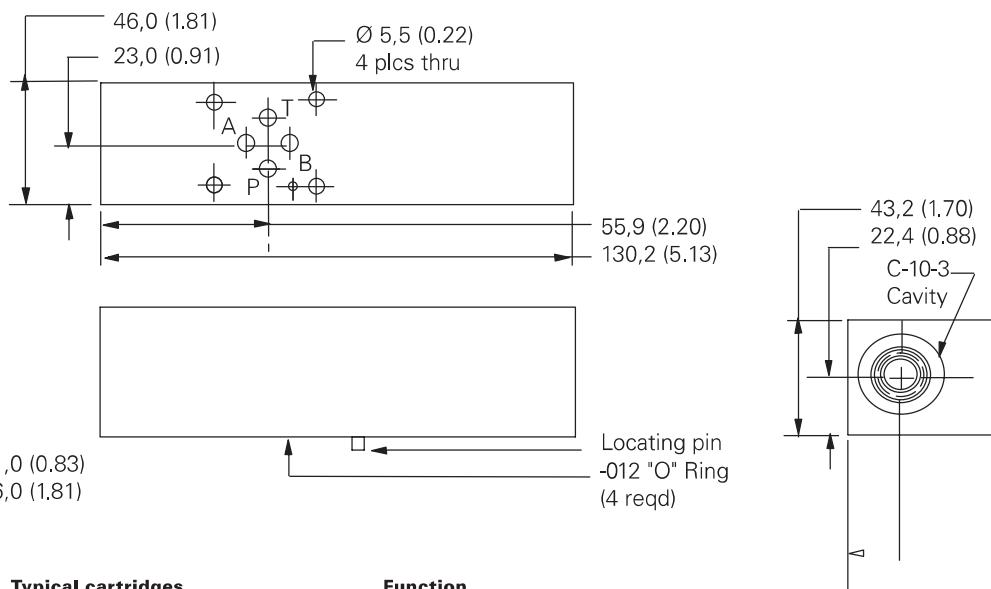
mm (inch)

Cavity porting

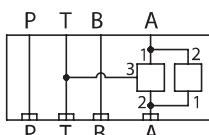
Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)



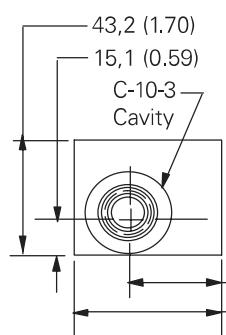
A310B Housing kit
Part Number **02-185363**



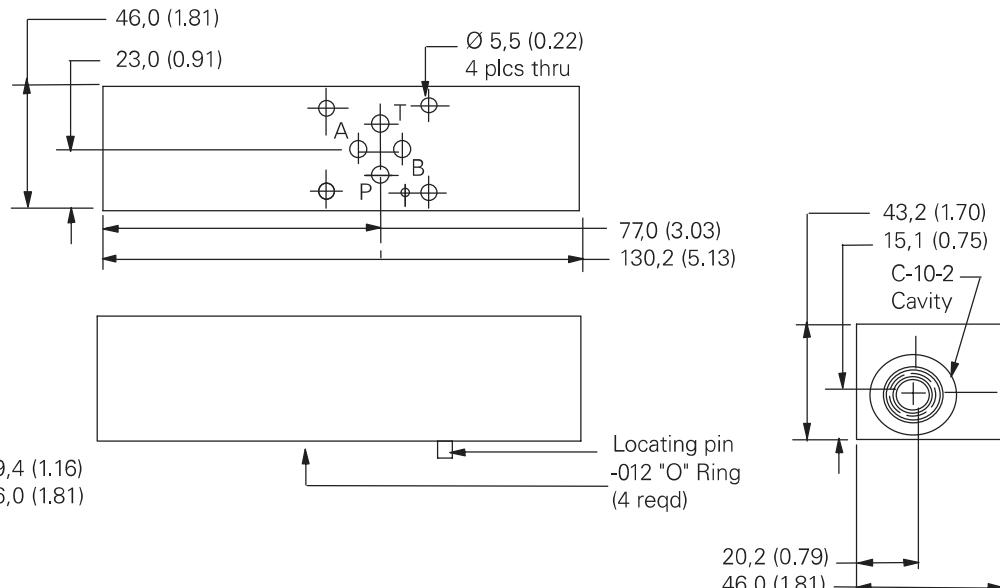
Typical cartridges	Function
PRV7-10 & CV3-10-P-0-3	Reducing on B drained to T reverse free flow check

Cavity porting

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



A316A Housing kit
Part Number **02-185372**



Typical cartridges	Function
PSV7-10 & CV3-10-P-0-3	Sequence valve in to A reverse free flow check

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

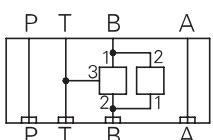
Dimensions

ISO 4401-03/CETOP03 Housing kits

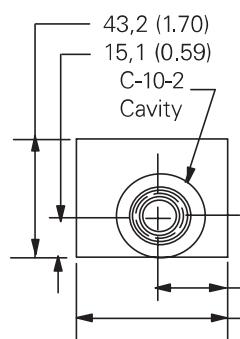
Dimensions

mm (inch)

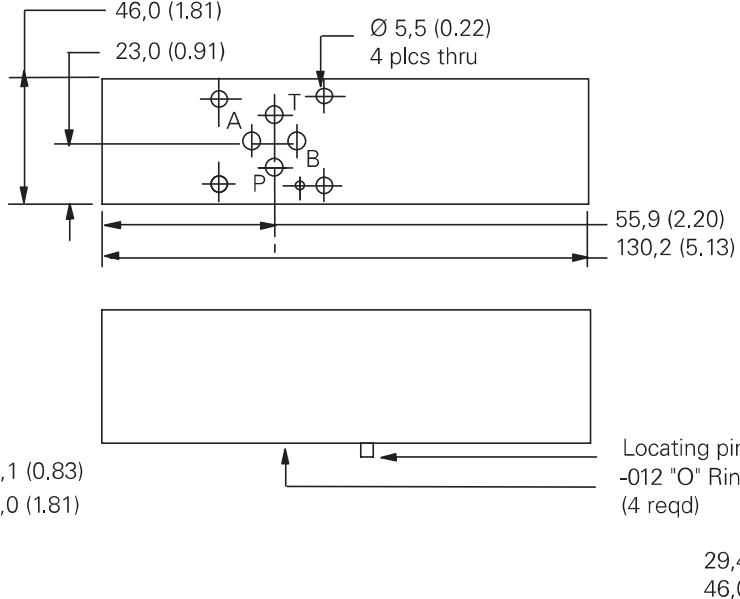
Cavity porting



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



A316B Housing kit
Part Number **02-185373**



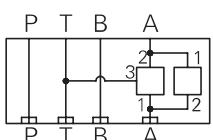
Typical cartridges

PSV7-10 &
CV3-10-P-0-3

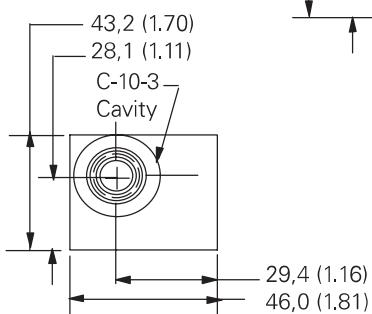
Function

Sequence valve in to B reverse free flow check

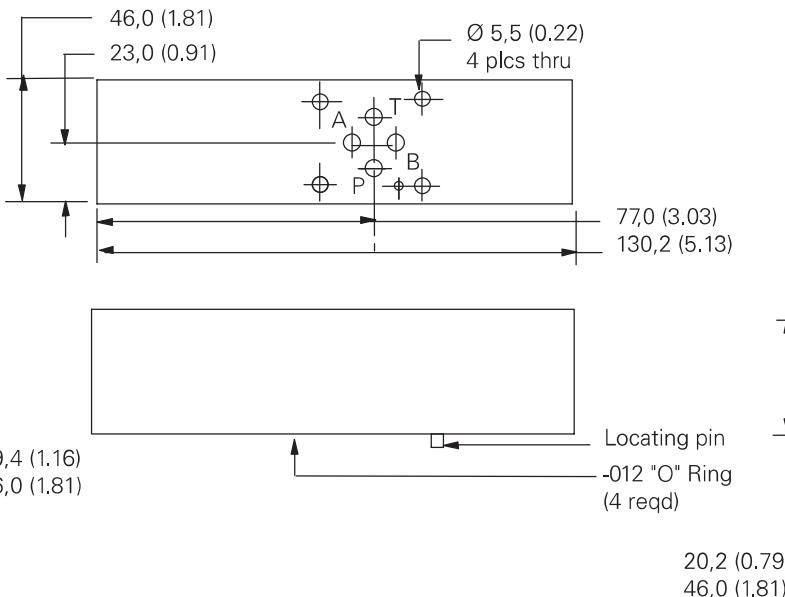
Cavity porting



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



A319A Housing kit
Part Number **02-185377**



Typical cartridges

PSV7-10 &
CV3-10-P-0-3

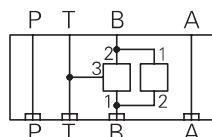
Function

Sequence valve out of A reverse free flow check

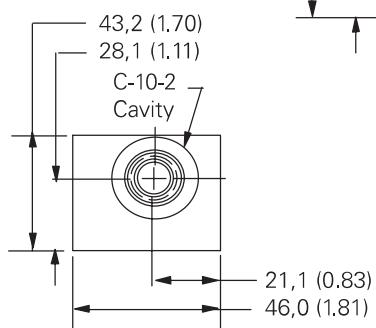
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

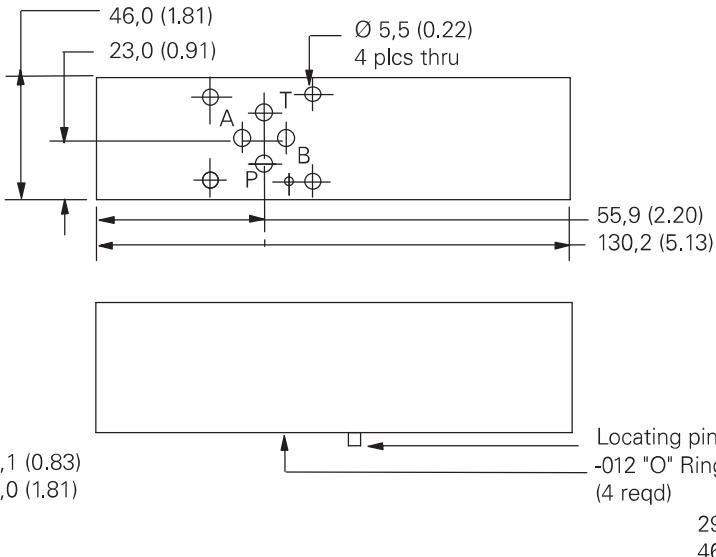
mm (inch)

Cavity porting

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



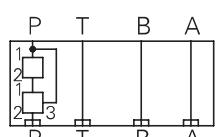
A319B Housing kit
Part Number **02-185378**

**Typical cartridges**

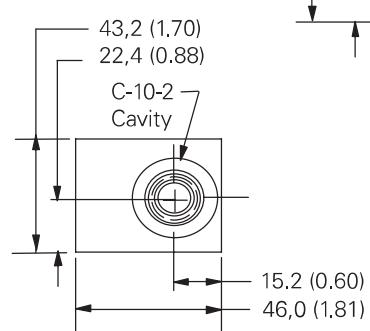
PSV7-10 &
CV3-10-P-0-3

Function

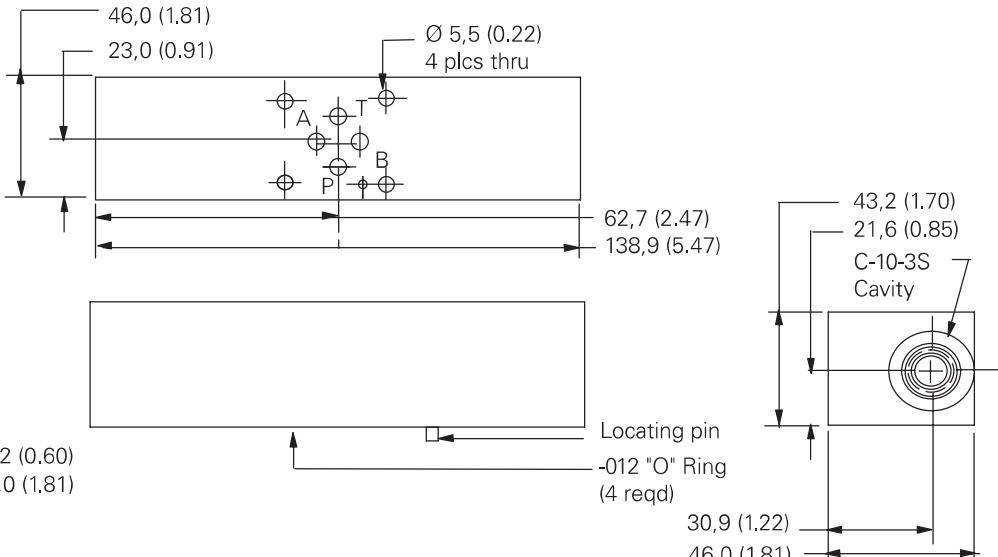
Sequence valve out of B reverse free flow check

Cavity porting

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



A313P Housing kit
Part Number **02-185366**

**Typical Cartridges**

EPV-10 &
DPS2-10-F-F-0-160

Function

Proportional flow control pressure compensated on P

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

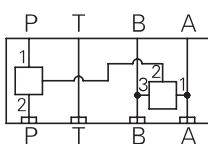
Dimensions

ISO 4401-03/CETOP03 Housing kits

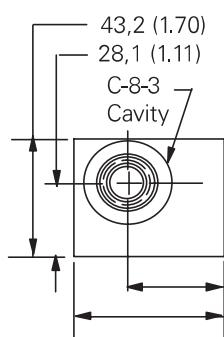
Dimensions

mm (inch)

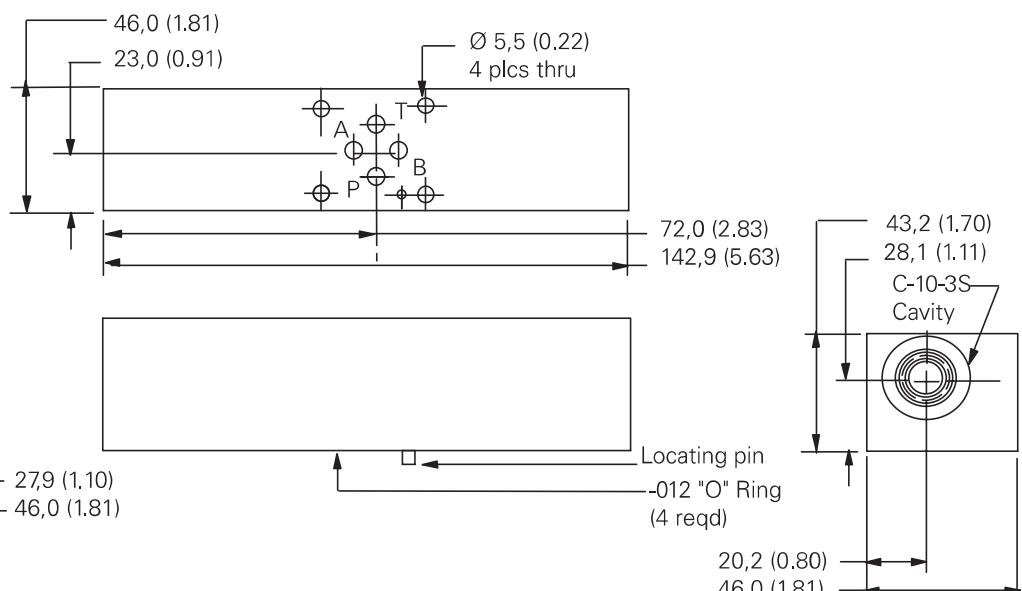
Cavity porting



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



A309P Housing kit
Part Number **02-185381**



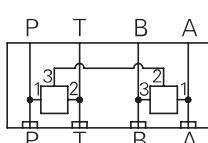
Typical cartridges

DPS2-10-F-F-0-* & DSV2-8-B-0

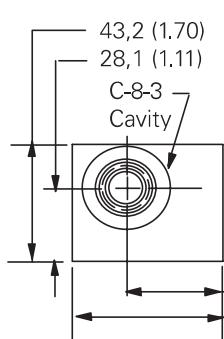
Function

Pressure compensator restrictive on P with shuttle sense from A & B

Cavity porting

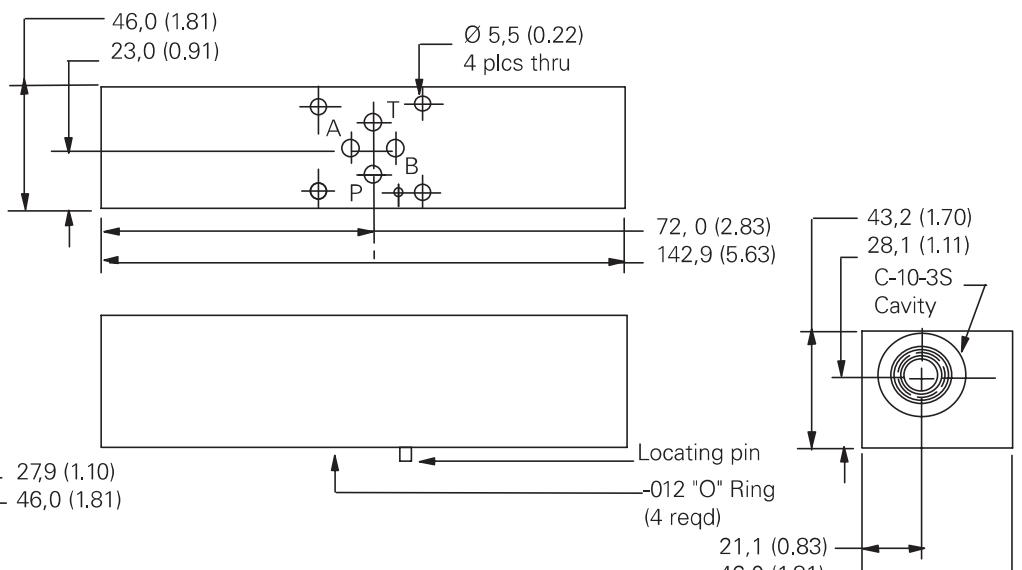


Torque cartridge in housing
C-8-3 34-40 Nm (25-30 ft. lbs)
C-10-3 48-54 Nm (35-40 ft. lbs)



A319P Housing kit

Part Number **02-185382**



Typical cartridges

DPS2-10-P-F-0-* & DSV2-8-B-0

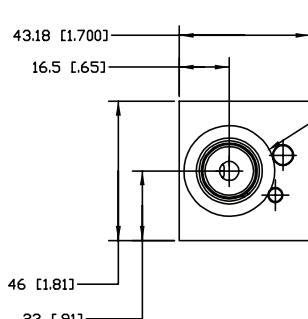
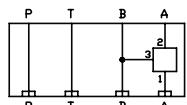
Function

Pressure compensator bypass to T with shuttle sense from A & B

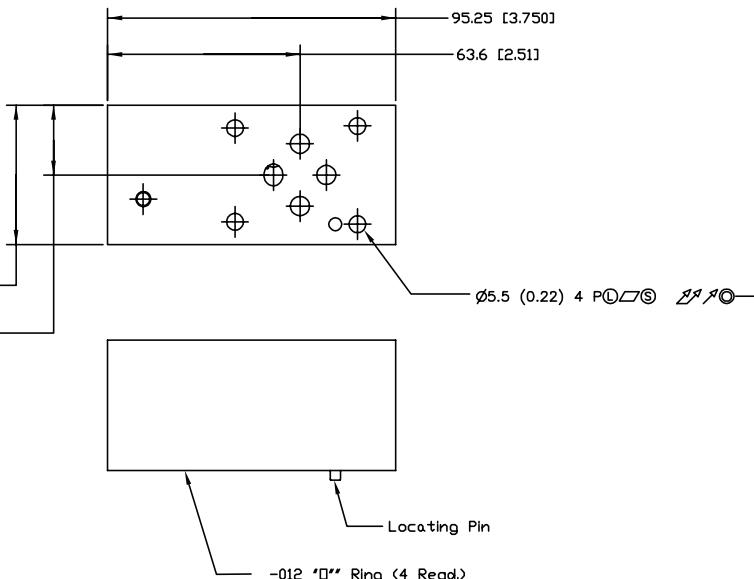
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

mm (inch)

**A323A Housing kit**

Part Number 6025820-001



Torque cartridge in housing
81 - 93 Nm (60-70 ft. lbs)

Typical cartridges**Function**

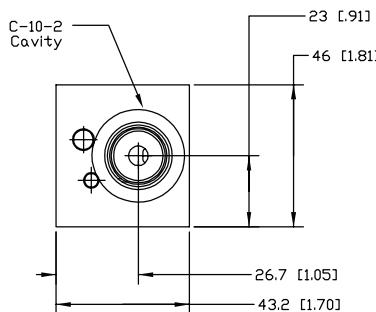
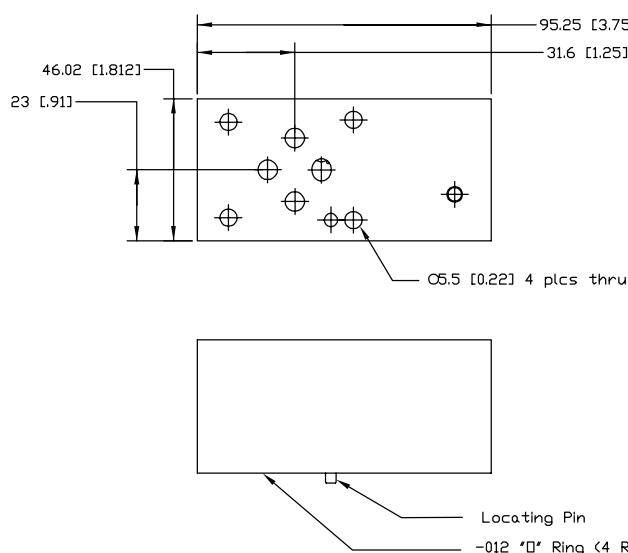
4CK30	PO Check Valve on A and Pilot from B
1CE30	Counterbalance Valve on A and Pilot from B

Dimensions

mm (inch)

A323B Housing kit

Part Number 6025821-001

**Typical Cartridges****Function**

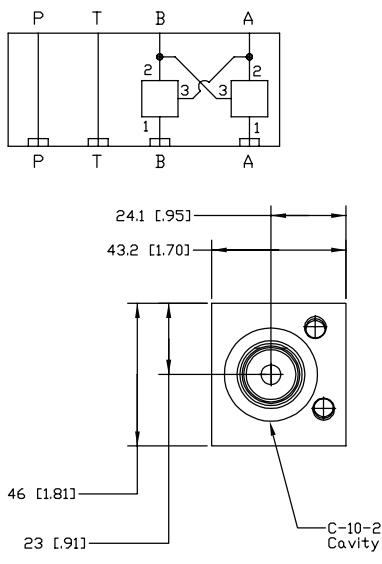
4CK30	PO Check Valve on B and Pilot from A
1CE30	Counterbalance Valve on B and Pilot from A

Dimensions

ISO 4401-03/CETOP03 Housing kits

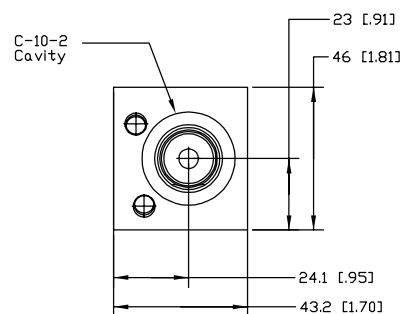
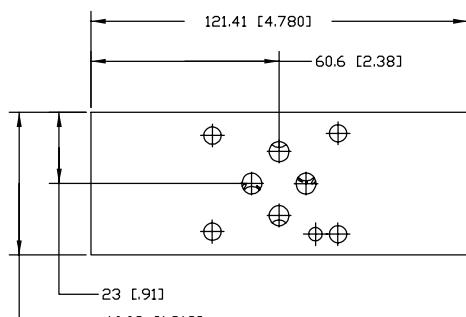
Dimensions

mm (inch)

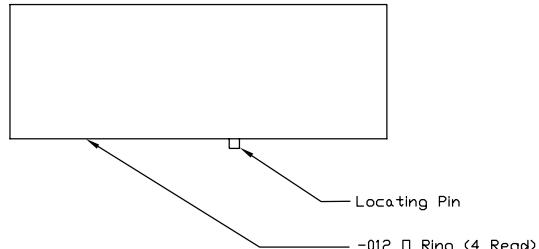


A323W - Housing Kit

Part Number 6025822-001



Torque cartridge in housing
81 - 93 Nm (60-70 ft. lbs)



Typical cartridges	Function
4CK30	PO Check Valve on A and B Cross Piloted
1CE30	Counterbalance Valve on A and B Cross Piloted