

Sandwich valves

For applications up to 210 bar (3000 psi)



HYDRAULIC CONTROLS Pty Ltd

Sandwich valves

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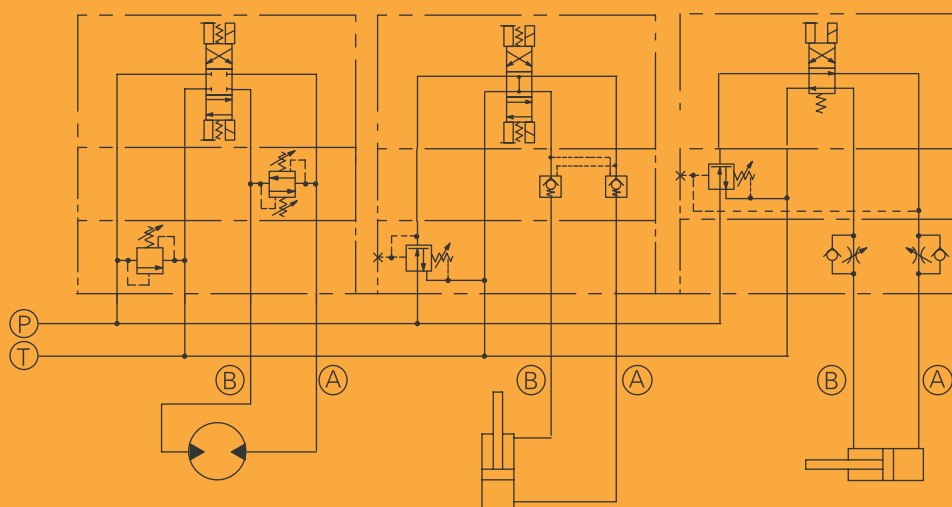
Typical Sandwich Valve System

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.

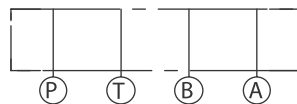


Figure 1

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).

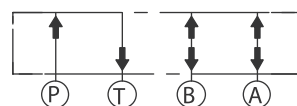


Figure 2

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

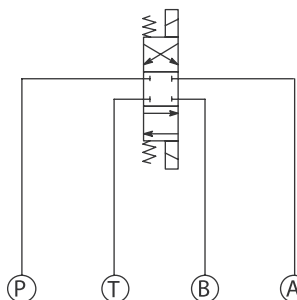


Figure 3

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).

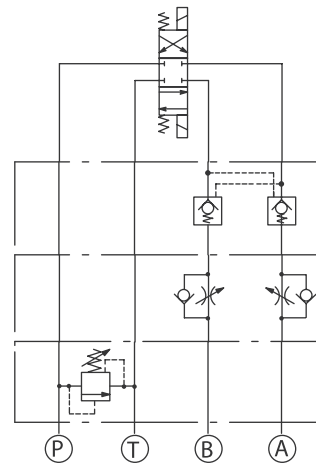


Figure 4

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.

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 L-6 thru L-19.

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

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

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

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

Sandwich valve model codes

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

we have followed the standard model code for the base valve with the following three exceptions:

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

Relief and Counterbalance Valves

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

Check Valves

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

3. **Flow settings:** To avoid confusion, the setting should

always be specified and not left blank. In the sandwich valve model codes, all flow settings are specified in tenths of a GPM without decimal points. (include trailing zeroes and leading zeros if where required.)

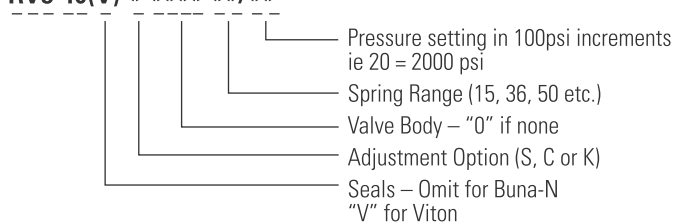
For example:

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

Two examples are shown below:

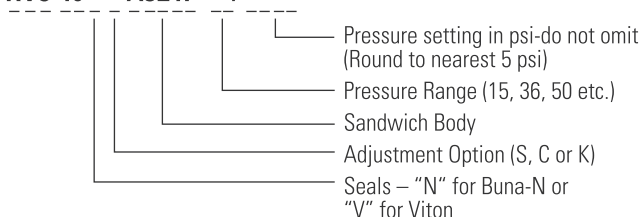
Base valve model code

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



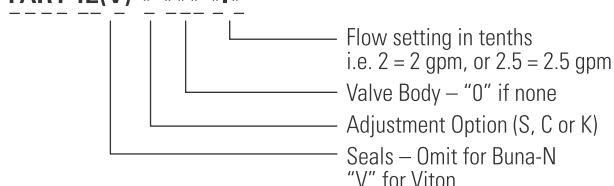
Sandwich valve model code (D03)

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



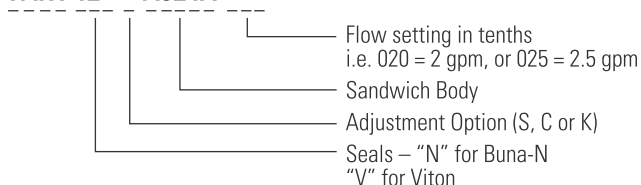
Base valve model code

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



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

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



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

Spare parts

For sandwich valve assemblies

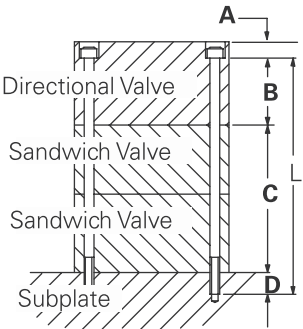
Accessory plates & stud rods

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

Filtration requirements

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

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.

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.

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



HYDRAULIC CONTROLS Pty Ltd



Pressure control functions

Sandwich valves locator
ISO 4401-03/CETOP03 series

⚠ Caution

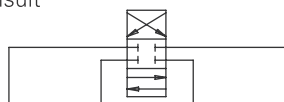
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

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

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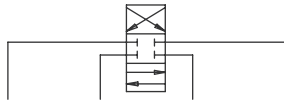
Function	Functional symbol	Model code	Housing kit
Solenoid Controlled Relief Valve P-T Normally Opened		SRV 10 * 0 S A322P 35/ ** ** Refer to page L-20 for model code breakdown	Model Part No. A322P 02-185344 Cartridge Cartridge Data Sheet SV5-8/RV-1-10 Section A/E C-8-2/C-10-2
Solenoid Controlled Relief Valve P-T Normally Closed		SRV 10 * C S A322P 35/ *** ** Refer to page L-20 for model code breakdown	Model Part No. A322P 02-185344 Cartridge SV5-8-C/ RV1-10 Cartridge Data Sheet Section A/E C-8-2/C-10-2
Dual Relief Valve A-T, B-T		1DR30 * A311W A** *B** * 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		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		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		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		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		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		PSV7 10 * * A316A **/**** 00 Refer to page L-21 for model code breakdown	Model Part No. A316A 02-185372 Cartridge PSV7-10/ CV3-10 Cartridge Data Sheet Section E/G C-10-3/C-10-2

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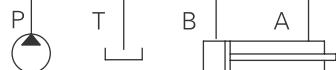
Pressure control functions

⚠ 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 02-185377
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 02-185373
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 02-185378
Reducing Valve on (P) Drained to T		PRV2 10 * * A326P **/**** 00 Refer to page L-21 for model code breakdown	Model Part No.	A326P 02-185353
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 02-185362
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 02-185363
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 02-185381
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 02-185382

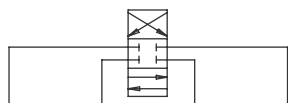


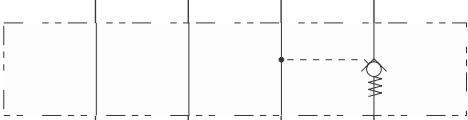
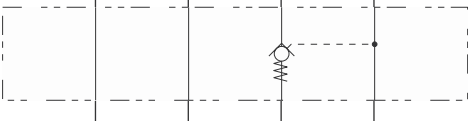
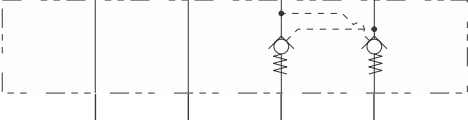
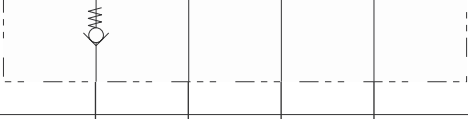
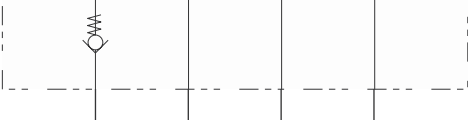
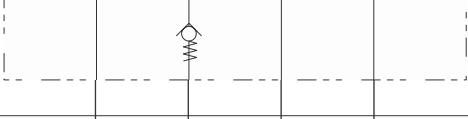
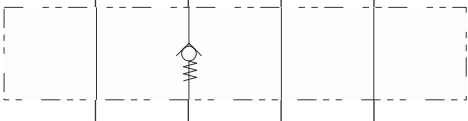
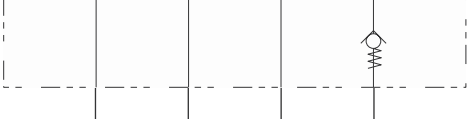
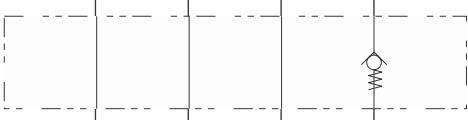
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Check & pilot check functions

Caution

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

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Check and flow control functions

Caution

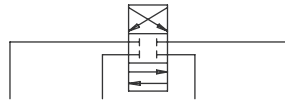
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

Function	Functional symbol				Model code	Housing kit	
	P	T	B	A		Model Part No.	
Check Valve On B Free Flow Out					CV3 8 * P A307B *** 00	A307B 02-185355	CV3-8 Section G C-8-2
Check Valve On B Free Flow Out					CV3 10 * P A314B *** 00	A314B 02-185368	CV3-10 Section G C-10-2
Check Valve On T On A & B					CV3 8 * P A320T *** 00	A320T 02-185379	CV3-8 qty 2 Section G C-8-2 qty 2
Check Valve on T to A & B					CV10 10 * P A317T *** 00	A317T 02-185375	CV3-10 qty 2 Section G C-10-2 qty 2
Anti-Cavitation Check P-T					CV16 10 * P A321P *** 00	A321P 02-185342	CV16-10-P-O-5 Section G C-10-2
Shuttle Valve A & B Output External					DSV2 8 * B A309W 00	A309W 02-185361	DSV2-8-B-0 Section G C-8-3
Flow Control Meter in P					NV1 10 * * A324P 00	A324P 02-185350	NV1-10 Section H C-10-2
Flow Control & Check Meter in A					FCV7 10 * * A324A FF 00	A324A 02-185348	FCV7-10 Section H C-10-2
Flow Control & Check Meter Out A					FCV7 10 * * A314A FF 00	A314A 02-185367	FCV7-10 Section H C-10-2
Flow Control & Check Meter in B					FCV7 10 * * A324B FF 00	A324B 02-185349	FCV7-10 Section H C-10-2
	P	T	B	A			

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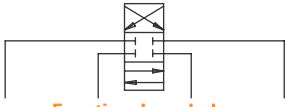
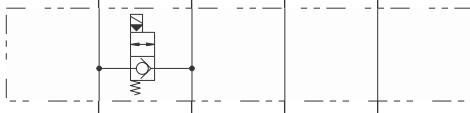
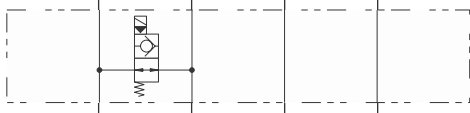
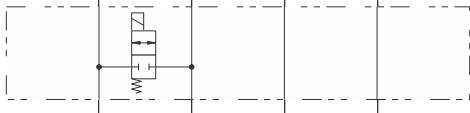
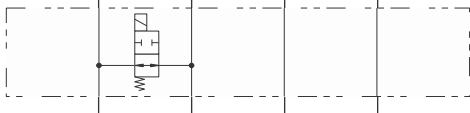
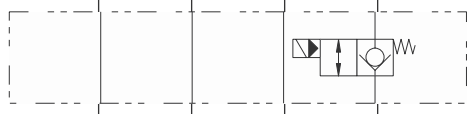
Function	Functional symbol				Model code	Housing kit	
	P	T	B	A			
Flow Control & Check Meter Out B					FCV7 10 * * A314B FF 00	Model Part No. A314B 02-185368	Cartridge Data Sheet FCV7-10 Section H C-10-2
Flow Control & Check Meter In A & B					FCV7 10 * * A324W FF 00 Refer to page L-22 for model code breakdown	Model Part No. A324W 02-185351	Cartridge Data Sheet FCV7-10 qty 2 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 02-185369	Cartridge Data Sheet FCV7-10 qty 2 Section H C-10-2 qty 2
Flow Regulator Pressure Compensated and Check Meter in P					FAR1 10 * * A324P *** 00	Model Part No. A324P 02-185350	Cartridge Data Sheet FAR1-10 Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter in A					FAR1 10 * * A314A *** 00	Model Part No. A314A 02-185367	Cartridge Data Sheet FAR1-10 Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter Out A					FAR1 10 * * A324A *** 00	Hsg kit: model Part No. A324A 02-185348	Cartridge Data Sheet FAR1-10 Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter in B					FAR1 10 * * A314B *** 00	Model Part No. A314B 02-185368	Cartridge Data Sheet FAR1-10 Section H C-10-2
Flow Regulator Pressure Compensated and Check Meter Out B					FAR1 10 * * A324B *** 00	Model Part No. A324B 02-185349	Cartridge Data Sheet FAR1-10 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 02-185369	Cartridge Data Sheet FAR1-10 qty 2 Section H C-10-2 qty 2

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

Flow control & solenoid control functions

Caution

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

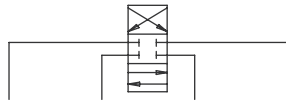
Function	Functional symbol	Model code	Housing kit
Flow Regulator Pressure Compensated and Check Meter Out A & B		FAR1 10 * * A324W A***B*** 00	Model Part No. A324W 02-185351 Cartridge Cartridge Data Sheet FAR1-10 qty 2 Section H C-10-2 qty 2
Proportional Flow Control Pressure Compensation on P		EPV 10 * * A313P *** * * 00 Refer to page L-23 for model code breakdown	Model Part No. A313P 02-185366 Cartridge EPV-10, DPS2-10 Cartridge Data Sheet Section I & B C-10-2/C-10-3S
Solenoid 2 Way Poppet Type (P-T), N/C		SV3 10 * C A325P *** * 00	Model Part No. A325P 02-185352 Cartridge SV3-10-C Cartridge Data Sheet Section A C-10-2
Solenoid 2 Way Poppet Type (P-T), N/O		SV3 10 * O A325P *** * 00	Model Part No. A325P 02-185352 Cartridge SV3-10-O Cartridge Data Sheet Section A C-10-2
Solenoid 2 Way Spool type (P-T), N/C		SV4 10 * C A325P *** * 00	Model Part No. A325P 02-185352 Cartridge SV4-10-C Cartridge Data Sheet Section A C-10-2
Solenoid 2 Way Spool Type (P-T), N/O		SV4 10 * O A325P *** * 00	Model Part No. A325P 02-185352 Cartridge SV4-10-O Cartridge Data Sheet Section A C-10-2
Solenoid 2 Way Poppet Type Blocked on A Normally Closed		SV3 10 * C A324A *** * 00	Model Part No. A324A 02-185348 Cartridge SV3-10-C Cartridge Data Sheet Section A C-10-2

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

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	
	P	T	B	A			
Poppet Type Blocked on A Normally Open					SV3 10 * 0 A324A *** 00	Model Part No.	A324A 02-185348
						Cartridge Cartridge Data Sheet Cavity	SV3-10-0 Section A C-10-2
Spool Type Blocked on A Normally Closed					SV4 10 * C A324A *** 00	Model Part No.	A324A 02-185348
						Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
Spool Type Blocked on A Normally Open					SV4 10 * 0 A324A *** 00	Model Part No.	A324A 02-185348
						Cartridge Cartridge Data Sheet Cavity	SV4-10-0 Section A C-10-2
Poppet Type Blocked on B Normally Closed					SV3 10 * C A324B *** 00	Model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SVC3-10-C Section A C-10-2
Poppet Type Blocked on B Normally Open					SV3 10 * 0 A324B *** 00	Model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C Section A C-10-2
Spool Type Blocked on B Normally Closed					SV4 10 * C A324B *** 00	Model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SV4-10-C Section A C-10-2
Spool Type Blocked on B Normally Open					SV4 10 * 0 A324B *** 00	Model Part No.	A324B 02-185349
						Cartridge Cartridge Data Sheet Cavity	SV4-10-0 Section A C-10-2
Poppet Type Blocked on A & B Normally Closed					SV3 10 * C A324W *** 00	Model Part No.	A324W 02-185351
						Cartridge Cartridge Data Sheet Cavity	SV3-10-C qty 2 Section A C-10-2 qty 2
Poppet Type Blocked on A & B Normally Open					SV3 10 * 0 A324W *** 00	Model Part No.	A324W 02-185351
						Cartridge Cartridge Data Sheet Cavity	SV3-10-0 qty 2 Section A C-10-2 qty 2
	P	T	B	A			

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

Solenoid control functions

⚠ Caution

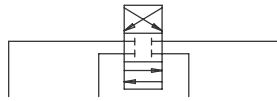
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

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

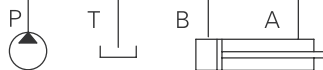
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⚠ Caution

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



Function	Functional symbol				Model code	Housing kit	
	P	T	B	A			
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 Cavity	SBV11-10-C 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 Cavity	SBV11-10-0 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 Cavity	SBV11-10-C 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 Cavity	SBV11-10-0 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 Cavity	SBV11-10-C qty 2 Section A C-10-2 qty 2
Poppet Type Bi-Directional Load Holding on A & B Normally Open					SBV11 10 * O A314W *** 00	Model Part No.	A314W 02-185369
						Cartridge Cartridge Data Sheet Cavity	SBV11-10-0 qty 2 Section A C-10-2 qty 2



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

Solenoid control functions

⚠ Caution

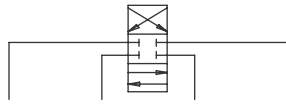
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

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

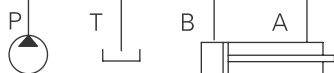
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

⚠ Caution

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



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

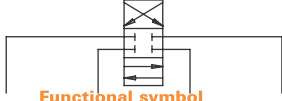
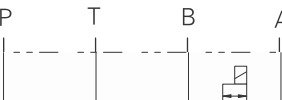
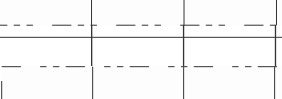
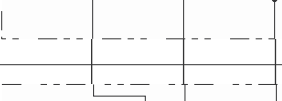
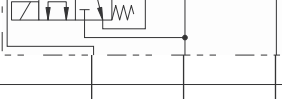


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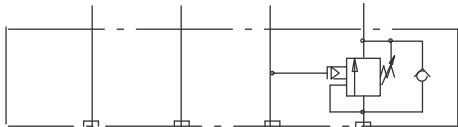
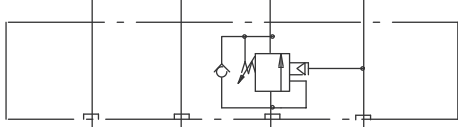
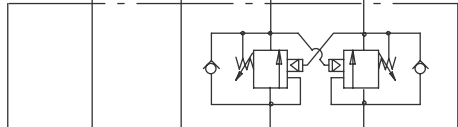
Solenoid control & load control functions

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 02-185376 Cartridge Cartridge Data Sheet 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 02-185376 Cartridge Cartridge Data Sheet SV4-10-O Section A C-10-2
Solenoid 3-Way Selector on P		SV1 10 * 3 A326P *** * 00	Model Part No. A326P 02-185353 Cartridge Cartridge Data Sheet SV1-10-3 Section A C-10-3
Solenoid 3-Way Selector on P		SV4 10 * 3 A326P *** * 00	Model Part No. A326P 02-185353 Cartridge Cartridge Data Sheet SV4-10-3 Section A C-10-3
Manual Rotary Selector on P		MRV3 10 * K A236P 00	Model Part No. A326P 02-185353 Cartridge Cartridge Data Sheet 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 6025820-001 Cartridge Cartridge Data Sheet 1CE30 Section F A6610
Counterbalance Valve on B Pilot from A		1CE30- * A323B-*** * *	Model Part No. A323B 6025821-001 Cartridge Cartridge Data Sheet 1CE30 Section F A6610
Counterbalance Valve On A & B Cross Piloted		1CE30- * A323WA-*** * */*** ** Refer to page L-23 for model code breakdown	Model Part No. A323W 6025822-001 Cartridge Cartridge Data Sheet 1CE30 qty 2 Section F A6610 qty 2

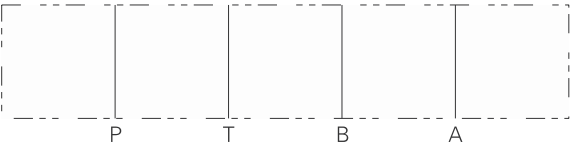
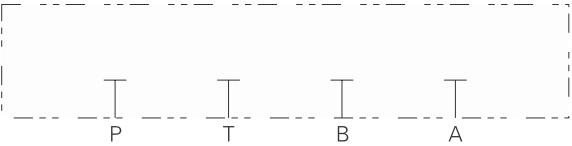
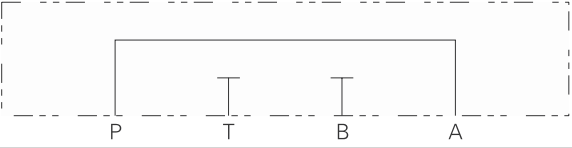
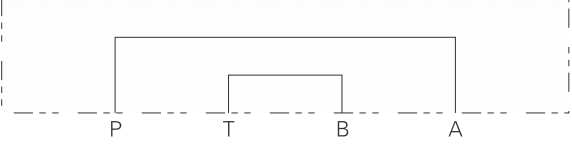
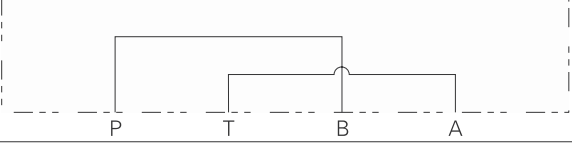
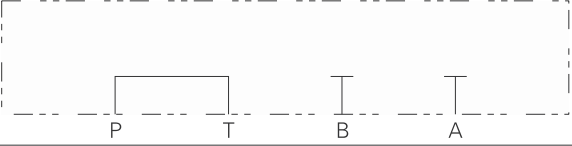
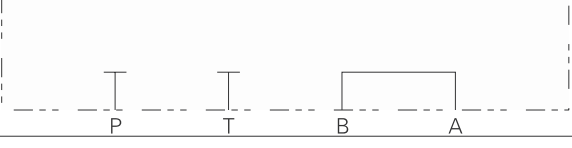
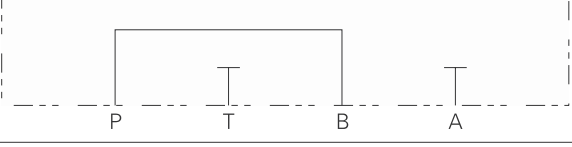
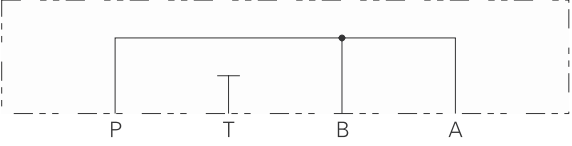
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Spacer/blanking/linking plates

⚠ Caution

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

Note: O-Rings to be ordered separately.

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

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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

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

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Model codes

For sandwich valve assemblies with two valves

1DR30 * A311W A ** / B ** / * **

1 2 3 4 5 6 7 8 9

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

PRV7 10 * * ***** ** / ***** **

1 2 3 4 5 6 7 8

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

PRV2 10 * * ***** ** / ***** **

1 2 3 4 5 6 7 8

1 Function

PRV2 -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

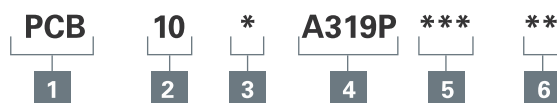
8 Special features

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)

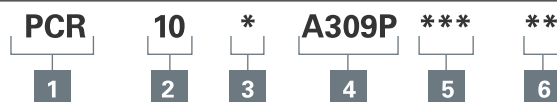
005 - 0,3 bar (5 psi)
010 - 0, 7 bar (10 psi)
020 - 1, 38 bar (20 psi)
040 - 2, 75 bar (40 psi)
080 - 5, 5 bar (80 psi)
160 - 11,0 bar (160 psi)

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)

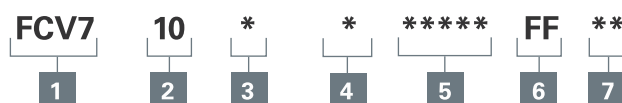
005 - 0,3 bar (5 psi)
010 - 0, 7 bar (10 psi)
020 - 1, 38 bar (20 psi)
040 - 2, 75 bar (40 psi)
080 - 5, 5 bar (80 psi)
160 - 11,0 bar (160 psi)

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

2 Size

10 - 10 Size

3 Seals

N - Buna-N
V - Viton®

4 Adjustment

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

5 Housing kit

A314W - Meter out
A324W - Meter in

6 Control flow option

FF - Needle valve with free reverse flow

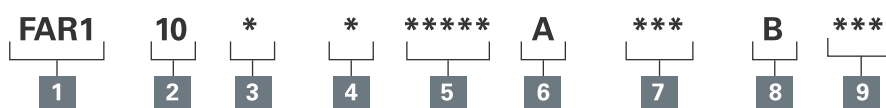
7 Special features

00 - None

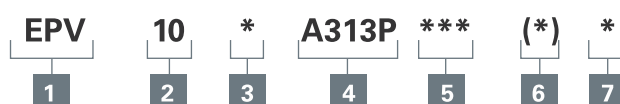
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model codes

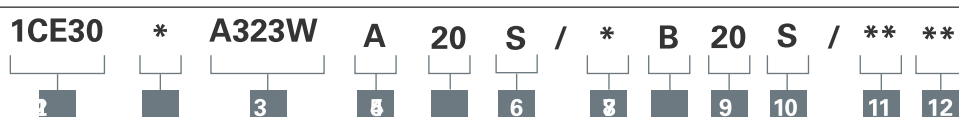
For sandwich valve assemblies with two valves



1 Function FAR1 - Fully adjustable flow regulator	4 Adjustment H - Calibrated handknob with locknut K - Handknob with locknut S - Screw with locknut	6 A port acted upon	8 B port acted upon
2 Size 10 - 10 Size	5 Housing kit A314W - Meter in A324W - Meter out	7 Factory set flow rate Specify in tenths of a gallon per minute. i.e. 025=2.5 USgpm	9 Factory set flow rate Specify in tenths of a gallon per minute. i.e. 025=2.5 USgpm
3 Seals N - Buna-N V - Viton®			



1 Function EPV -Proportional flow control	4 Housing kit	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-FF-0-160
2 Size 10 - 10 Size	5 Voltage range 12D - 24 VDC 24D- 24 VDC		
3 Seals N - Buna-N V - Viton®	6 Manual override option Blank - No manual override M- Pin type S- Screw type		



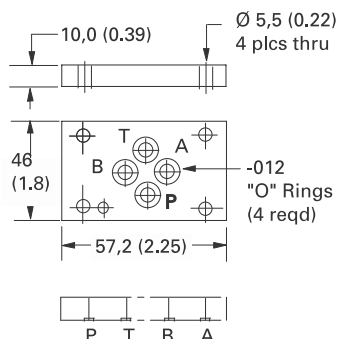
1 Pilot ratio/function 1CE30 - Overcenter	5 Pressure range 20 - (25:1 & 5:1) 70-210 bar. Standard setting 100 bar (10:1) 100-210 bar. Standard setting 100 bar. Setting made at 4.8 L/min.	8 B port acted upon	11 Pilot ratio 2- 2.5:1 5- 5:1 (Standard) 10- 10:1
2 Adjustment F - Screw N - Fixed	6 Seals S - 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.	12 Special features 00 - None
3 Housing kit	7 Pilot ratio 2- 2.5:1 5- 5:1 (Standard) 10- 10:1	10 Seals S - Buna-N SV - Viton®	
4 A port acted upon			

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

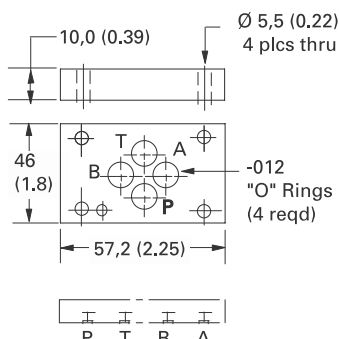
Dimensions

Spacer, blanking & linking plates

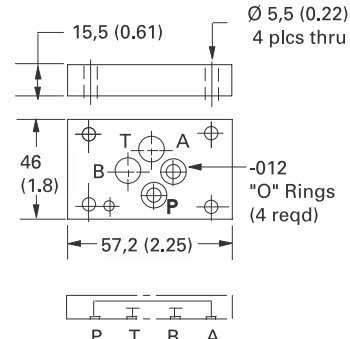
Spacer plate
02-185273



Blanking plate
02-185274

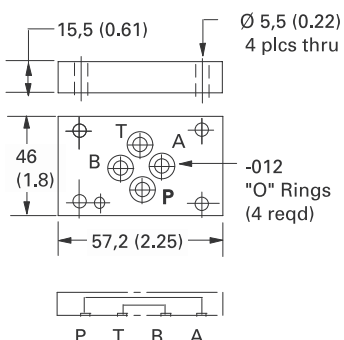


Linking plate
02-185275



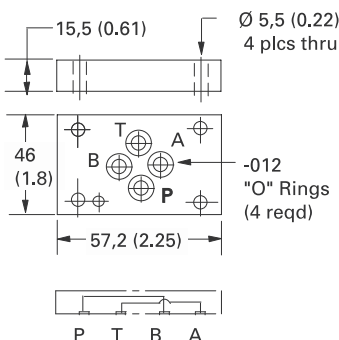
P to A with B & T blocked

Linking plate
02-185276



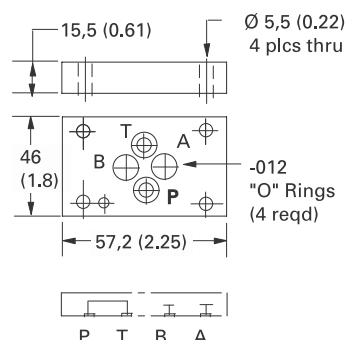
P to A with B & T

Linking plate
02-185277



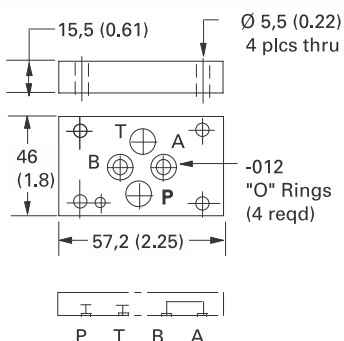
P to B with A & T

Linking plate
02-185278



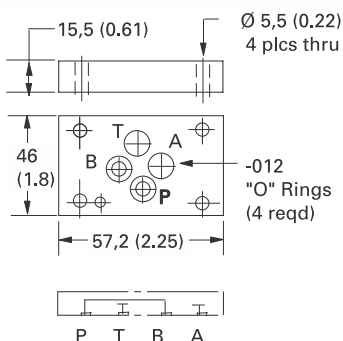
P to T with B & A blocked

Linking plate
02-185279



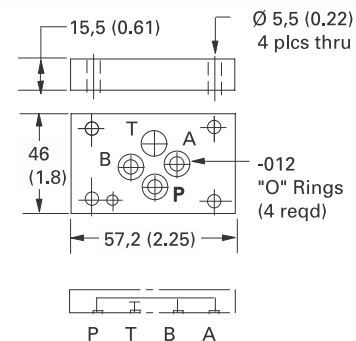
A to B with P & T blocked

Linking plate
02-185280



P to B with A & T blocked

Linking plate
02-185281



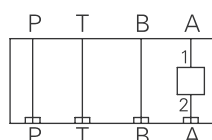
P to A & B with T blocked

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

Dimensions

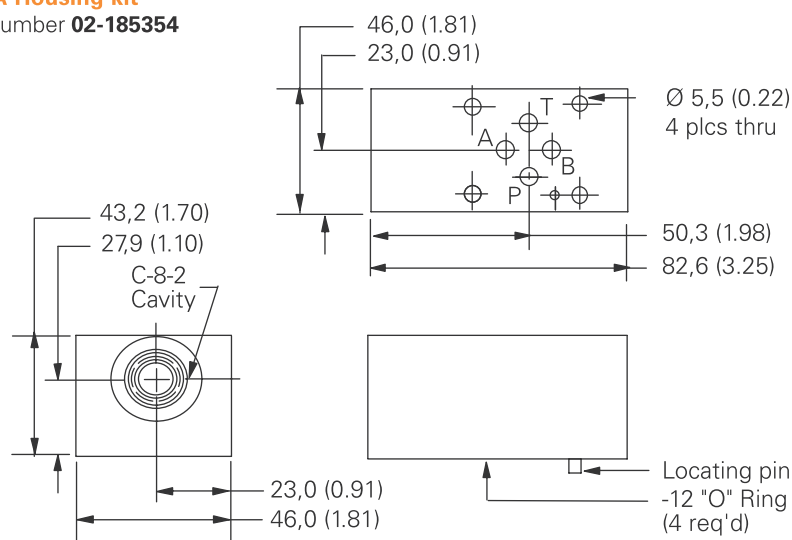
mm (inch)

Cavity porting



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

A307A Housing kit Part Number 02-185354



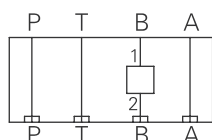
Typical cartridges

Function

CV3-8

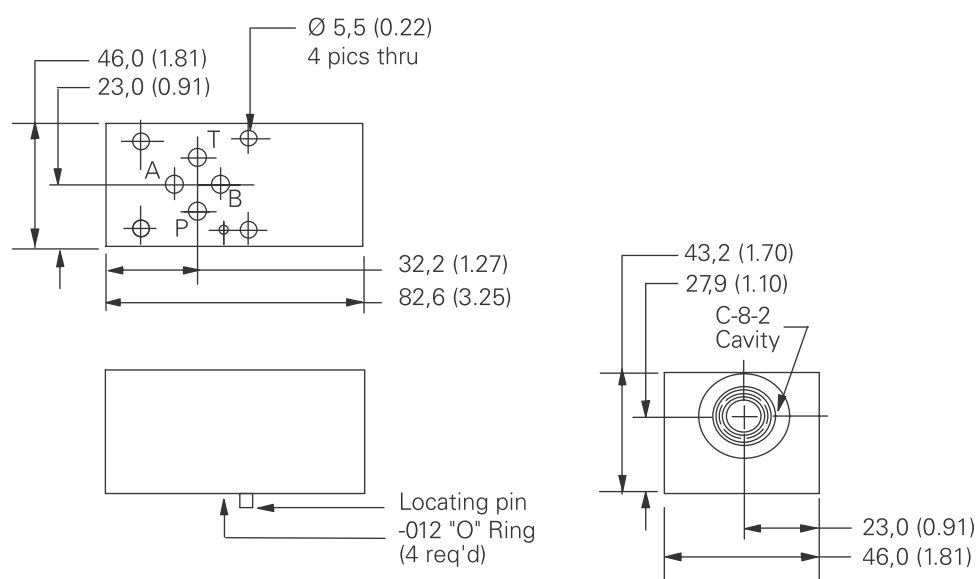
Check valve on A, Free flow out

Cavity porting



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

A307B Housing kit Part Number 02-185355



Typical cartridges

Function

CV3-8

Check valve on B, Free flow out

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

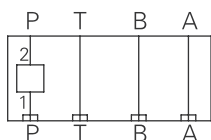
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

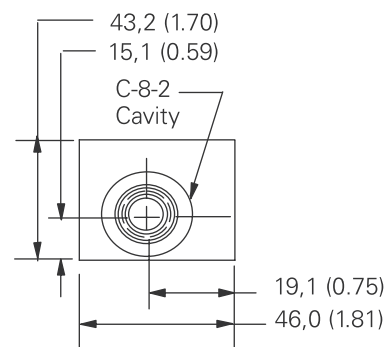
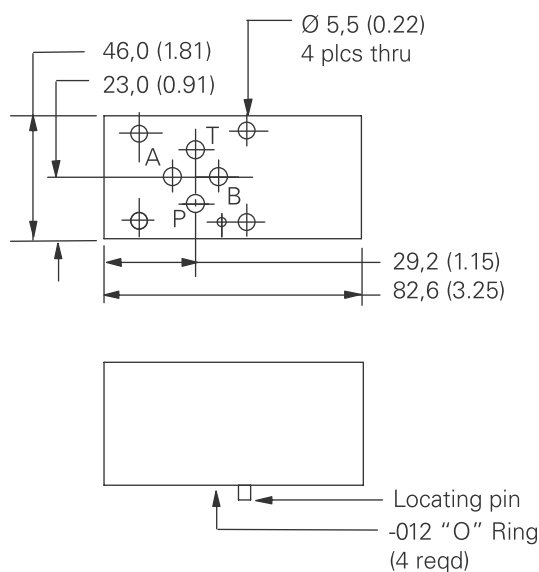
Cavity porting



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

A307P Housing Kit

Part Number **02-185356**



Typical cartridges

Function

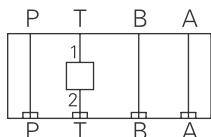
CV3-8

Check valve on P

Dimensions

mm (inch)

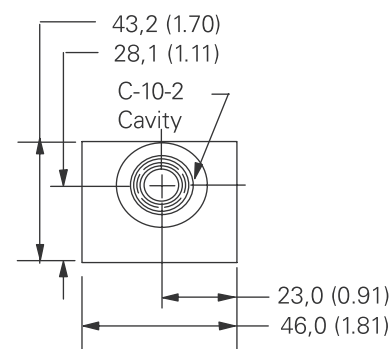
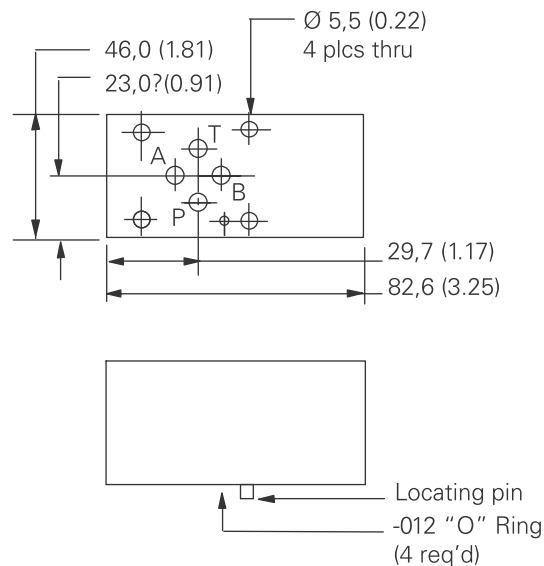
Cavity porting



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

A308T Housing kit

Part Number **02-185360**



Typical cartridges

Function

CV3-10

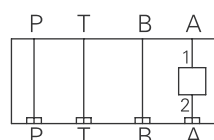
Check valve on T

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

Dimensions

mm (inch)

Cavity porting

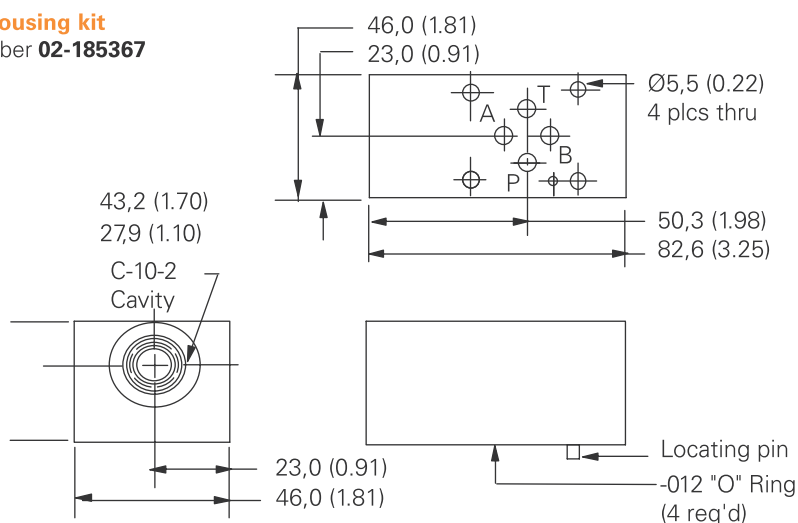


Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

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

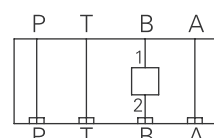
A314A Housing kit

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

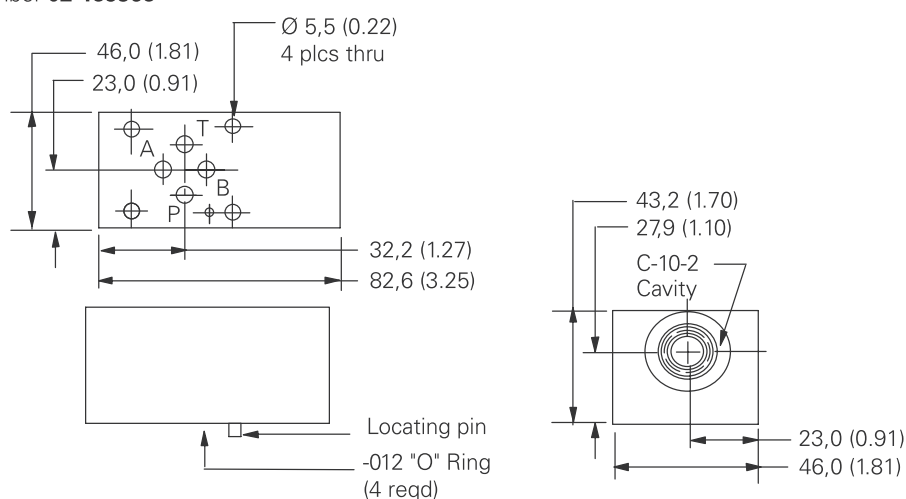


Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

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.

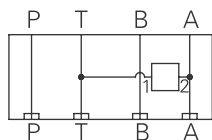
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

Cavity porting

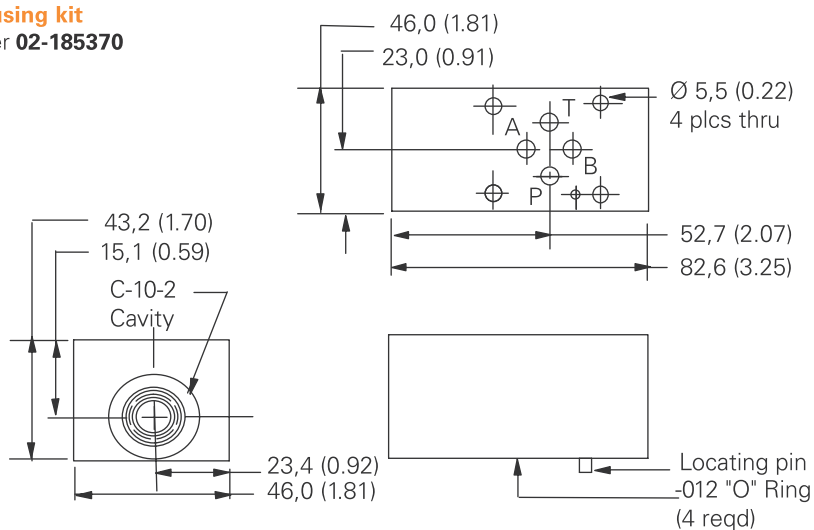


Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

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**

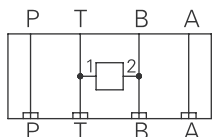


Typical cartridges

Function

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

Cavity porting

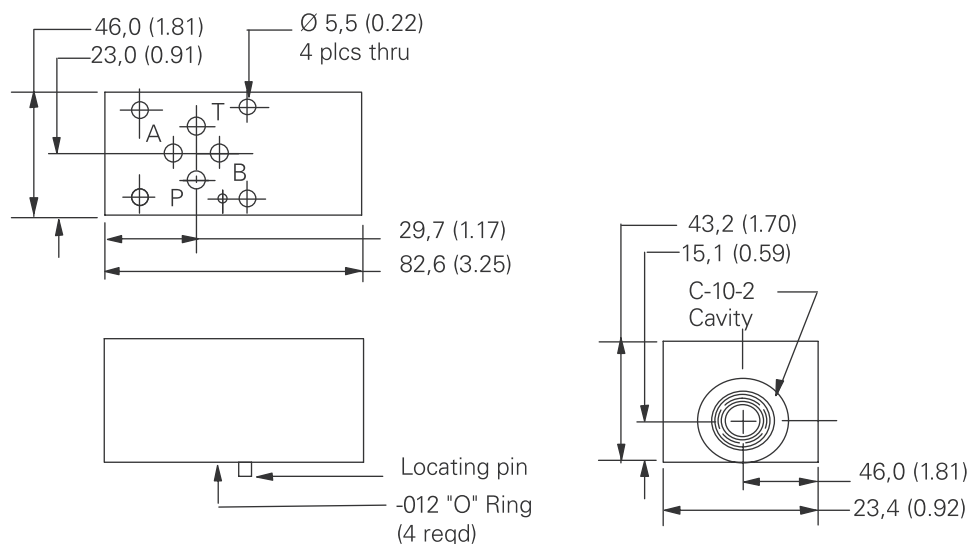


Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

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

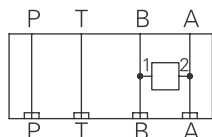
SV3-10-C	Solenoid 2-way poppet type unload B-T normally closed
SV3-10-O	Solenoid 2-way poppet type unload B-T normally open
SV4-10-C	Solenoid 2-way spool type unload B-T normally closed
SV4-10-O	Solenoid 2-way spool type unload B-T normally open

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

Dimensions

mm (inch)

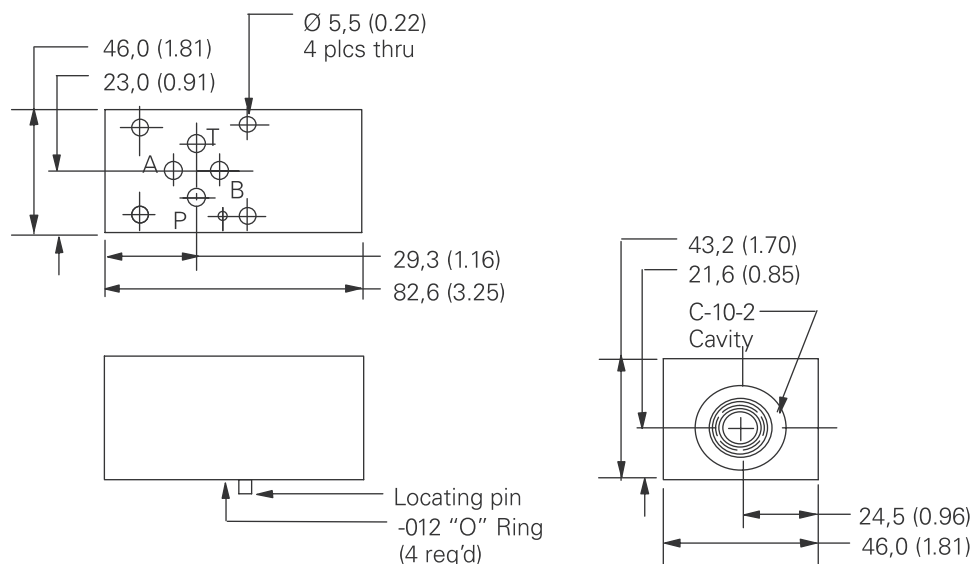
Cavity porting



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

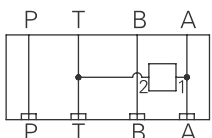
A318W Housing kit

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

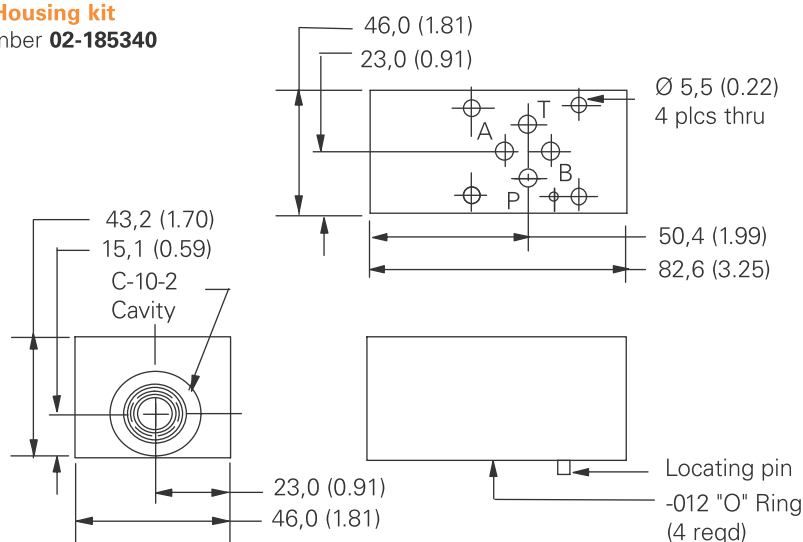


Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

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

A321A Housing kit

Part Number **02-185340**



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.

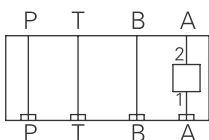
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

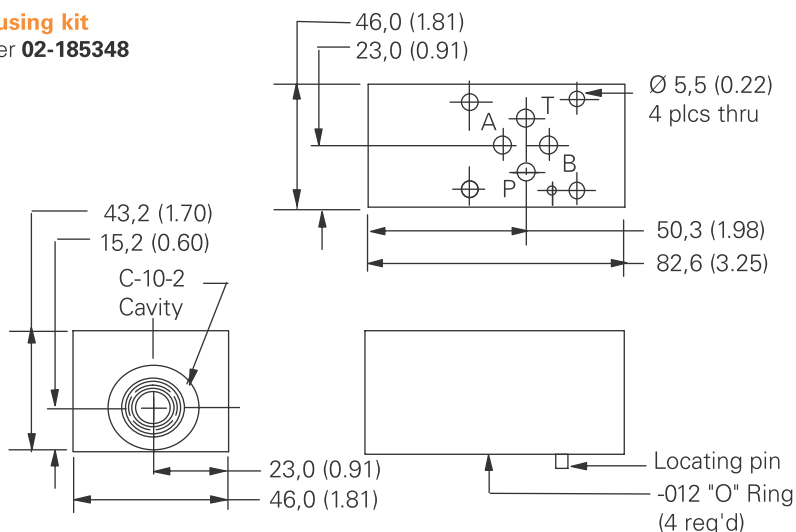
Cavity porting



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

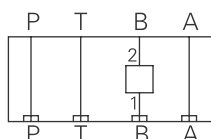


Typical cartridges

Function

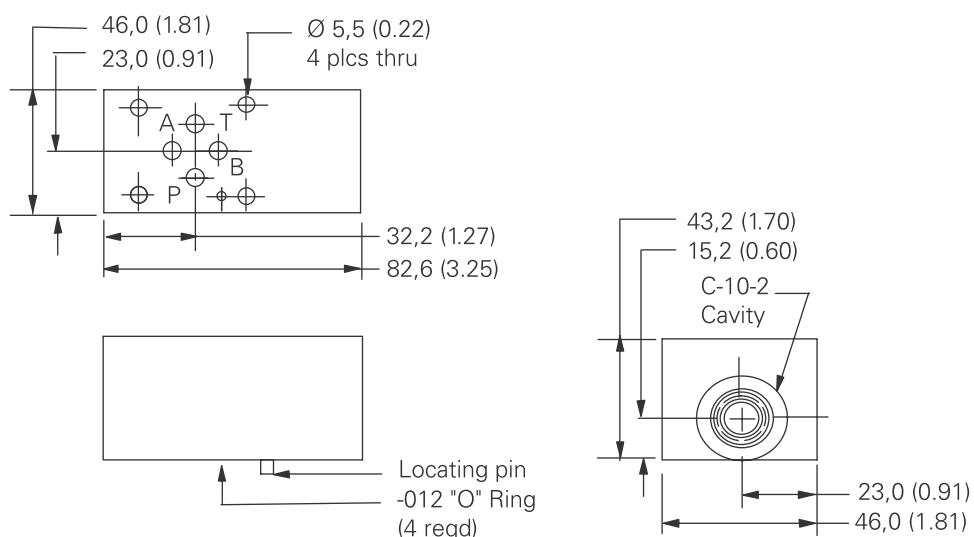
FAR1-10	Flow regulator pressure compensated and check, meter out A
FCV7-10	Flow control and check, meter in A
SV3-10-C	Solenoid 2-way poppet type blocking on A, normally closed
SV3-10-O	Solenoid 2-way poppet type blocking on A, normally open
SV4-10-C	Solenoid 2-way spool type blocking on A, normally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

Cavity porting



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

A324B Housing kit Part Number 02-185349



Typical cartridges

Function

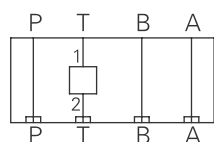
FAR1-10	Flow regulator pressure compensated and check, meter out B
FCV7-10	Flow control and check, meter in B
SV3-10-C	Solenoid 2-way poppet type blocking on B, normally closed
SV3-10-O	Solenoid 2-way poppet type blocking on B, normally open
SV4-10-C	Solenoid 2-way spool type blocking on B, normally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

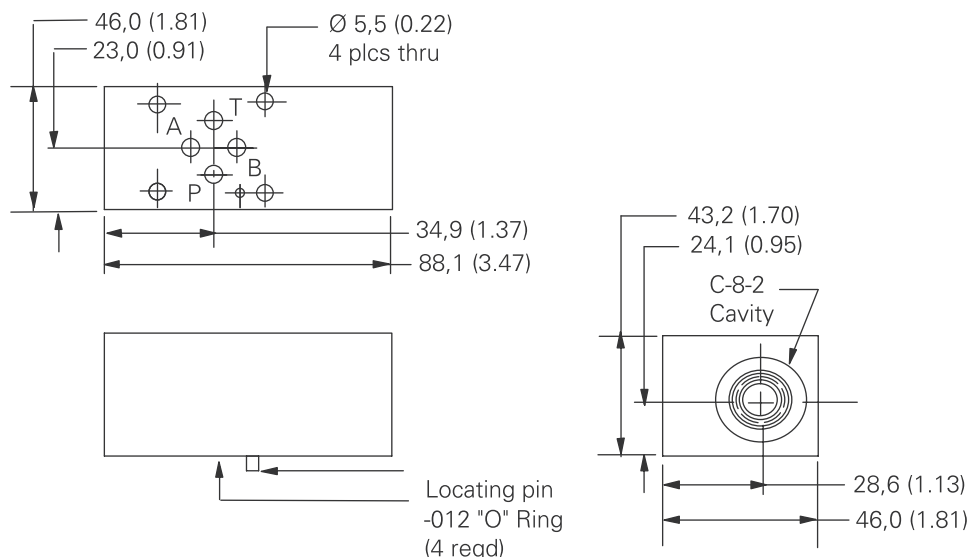
Cavity porting



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

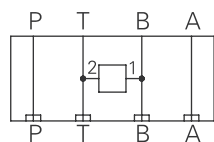
A307T Housing kit

Part Number **02-185357**



Typical cartridges	Function
CV3-8	Check valve on T

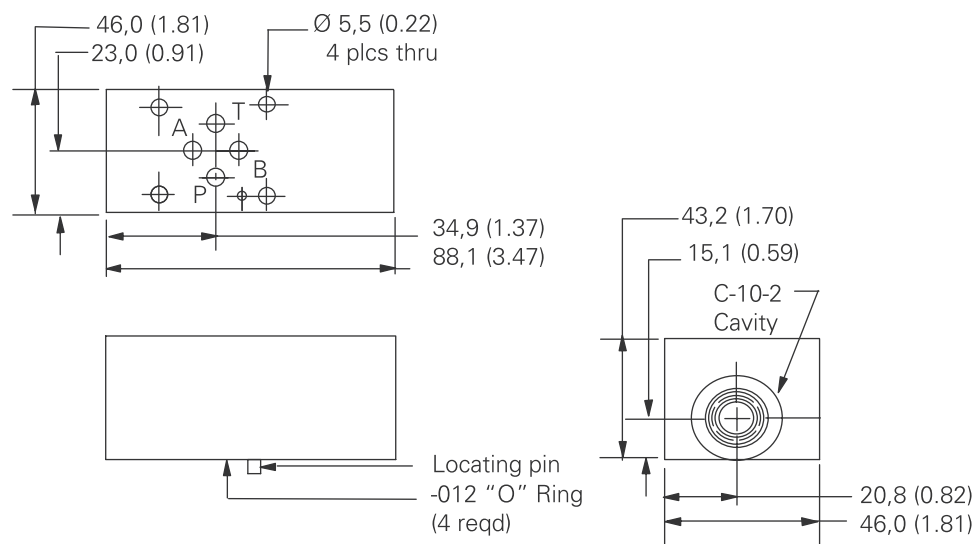
Cavity porting



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

A321B Housing kit

Part Number **02-185341**



Typical cartridges	Function
ERV1-10	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.

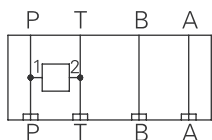
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

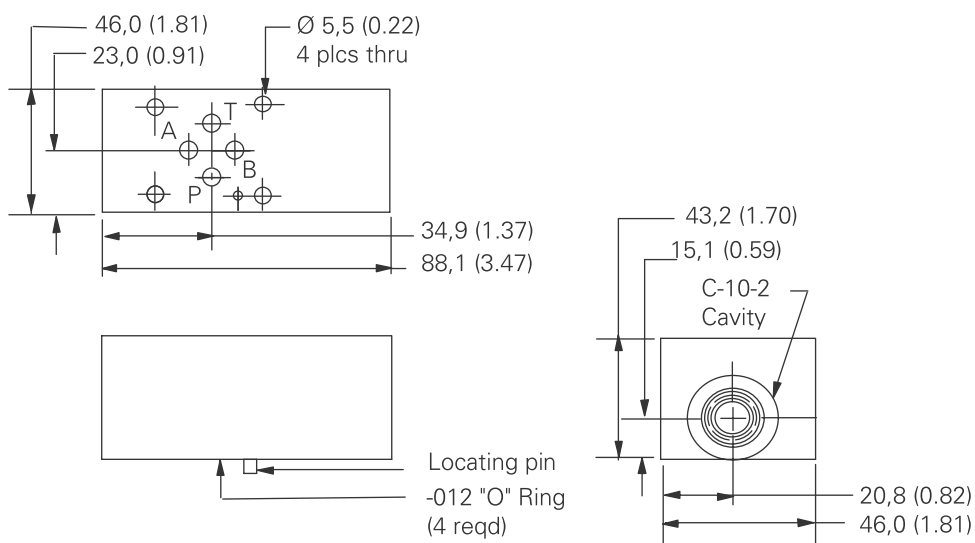
Cavity porting



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

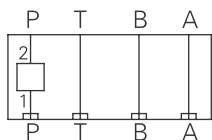
Note: This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

A321P Housing kit Part Number 02-185342



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

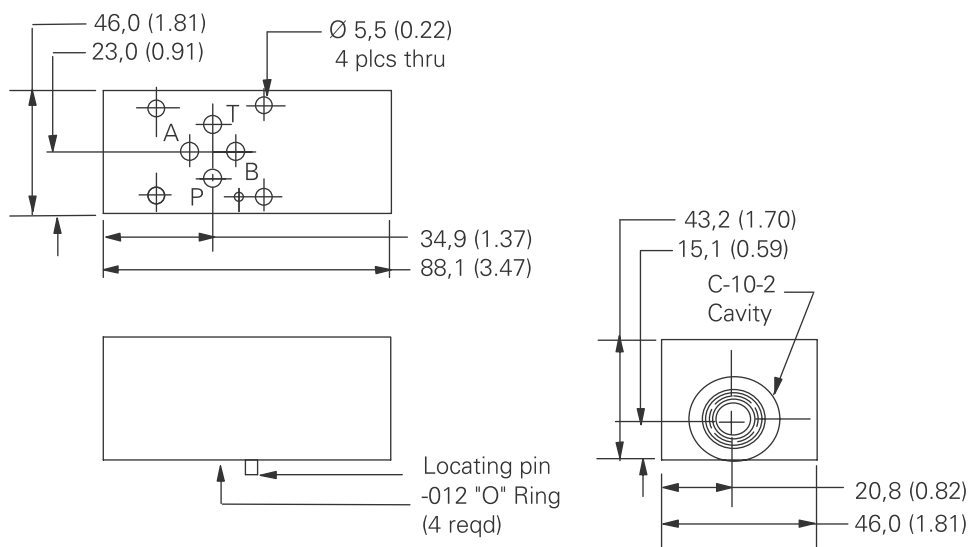
Cavity porting



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



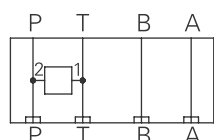
Typical cartridges	Function
CV3-10	Check valve on P
FAR1-10	Flow regulator pressure compensated, meter in P
NV1-10	Flow control, meter in P

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

Dimensions

mm (inch)

Cavity porting

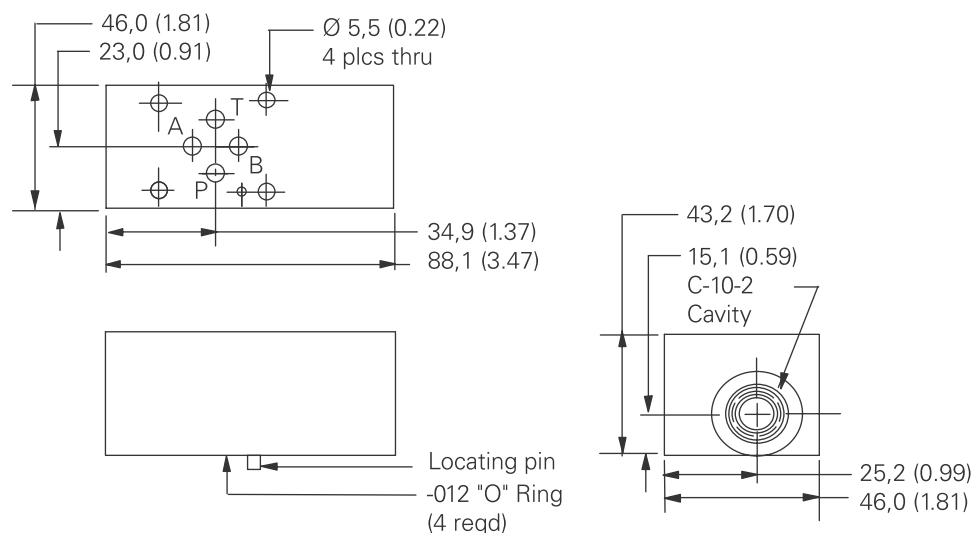


Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)

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

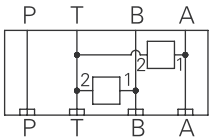
SV3-10-C	Solenoid 2-way poppet type P-T, normally closed
SV3-10-O	Solenoid 2-way poppet type P-T, normally open
SV4-10-C	Solenoid 2-way spool type P-T, normally closed
SV4-10-O	Solenoid 2-way spool type P-T, normally open

Dimensions

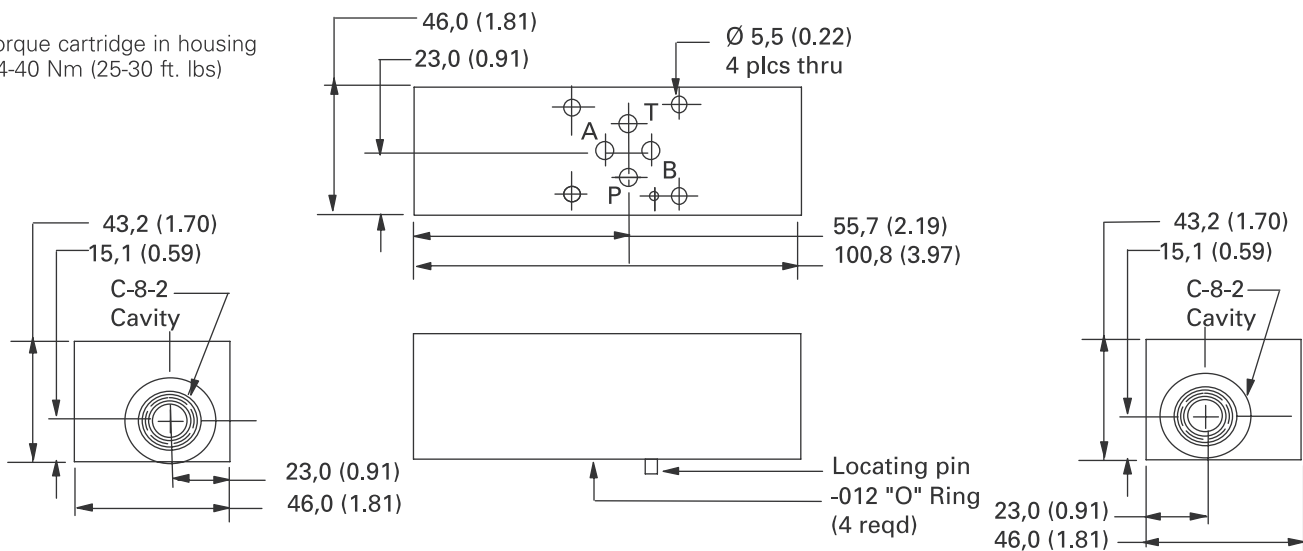
ISO 4401-03/CETOP03 Housing kits

Cavity porting

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



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



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

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

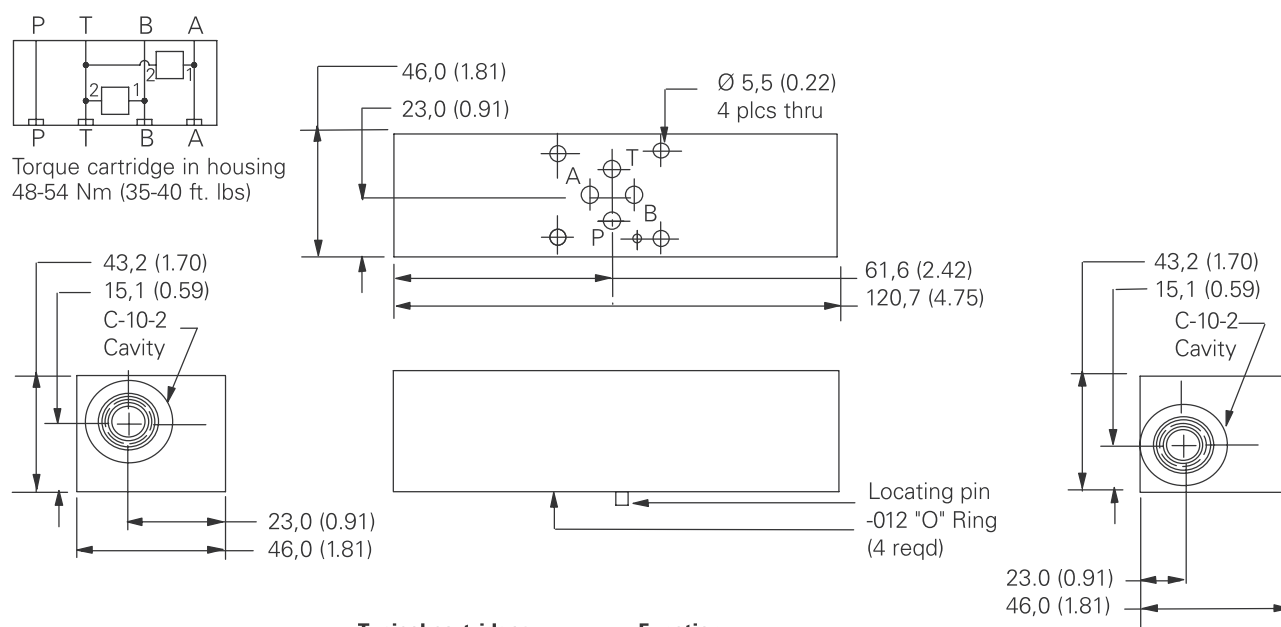
Dimensions

mm (inch)

A312W Housing kit

Part Number **02-185365**

Cavity porting



Typical cartridges

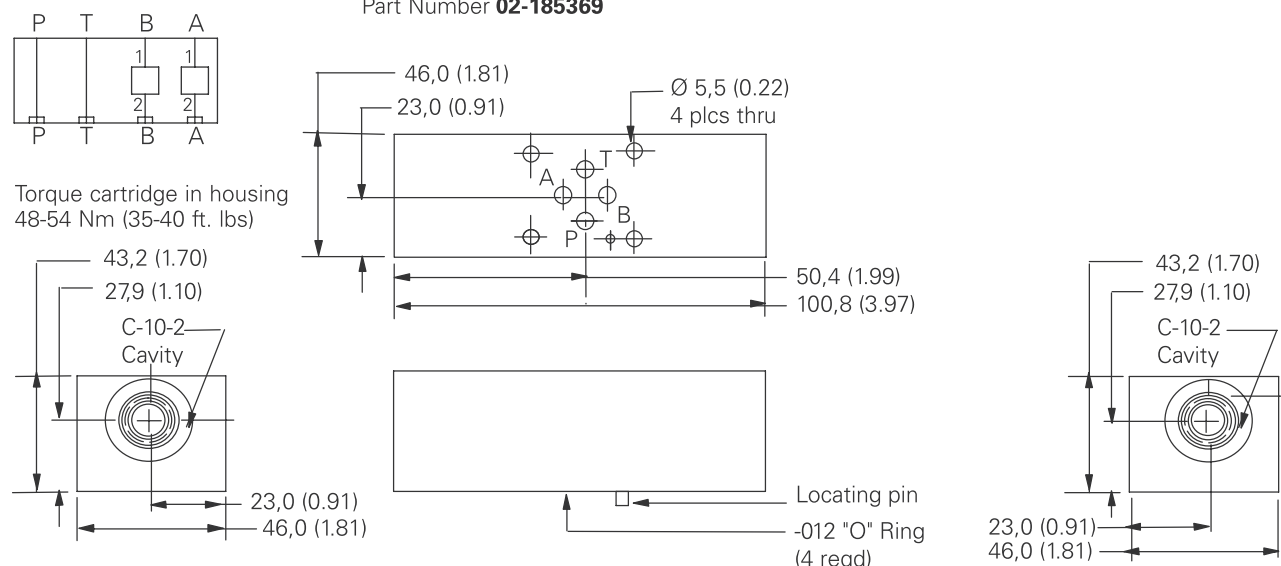
Function

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

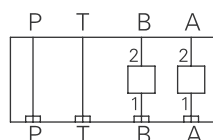
Dimensions

mm (inch)

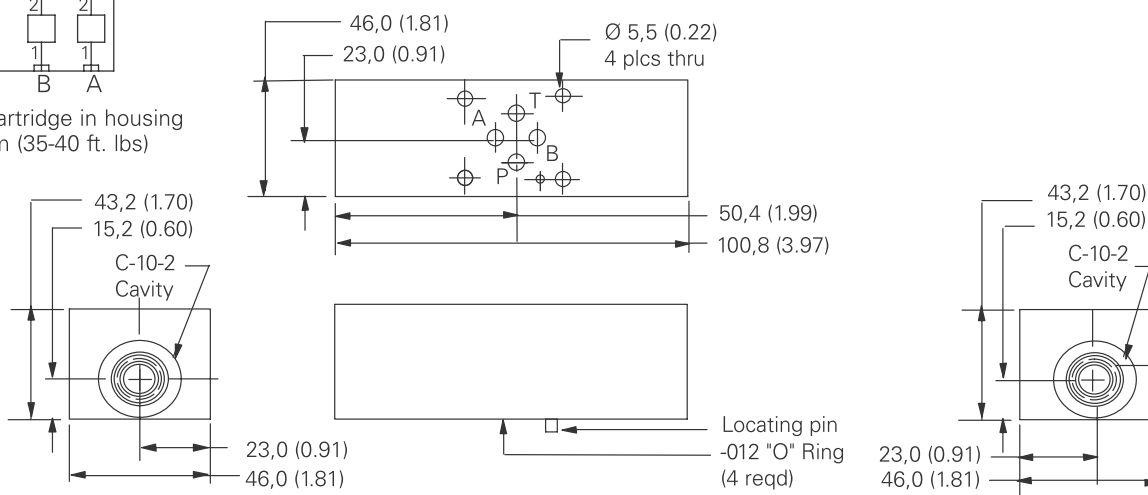
A324W Housing kit

Part Number **02-185351**

Cavity porting

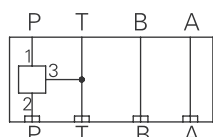


Torque cartridge in housing
48-54 Nm (35-40 ft. lbs)



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-O	Solenoid 2-way poppet type blocking on A & B normally open
SV4-10-C	Solenoid 2-way spool type blocking on A & B normally closed
SV4-10-O	Solenoid 2-way spool type blocking on A & B normally open

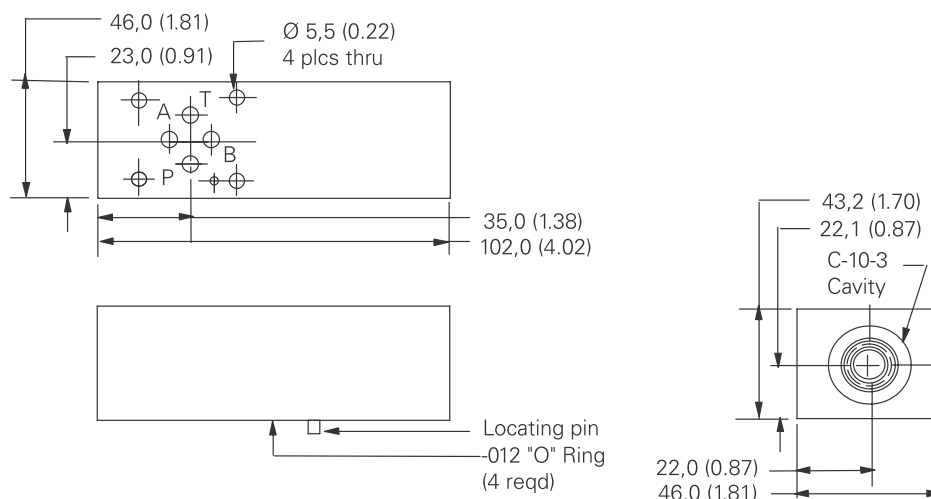
Cavity porting



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

A326P Housing kit

Part Number **02-185353**



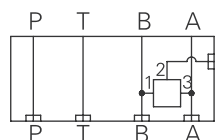
Typical cartridges	Function
MRV3-10-K-O	Manual rotary selector on P
PRV2-10	Reducing valve (P) drained to T
SV1-10-3	Solenoid 3-way selector on P
SV4-10-3	Solenoid 3-way selector on P

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

Dimensions

mm (inch)

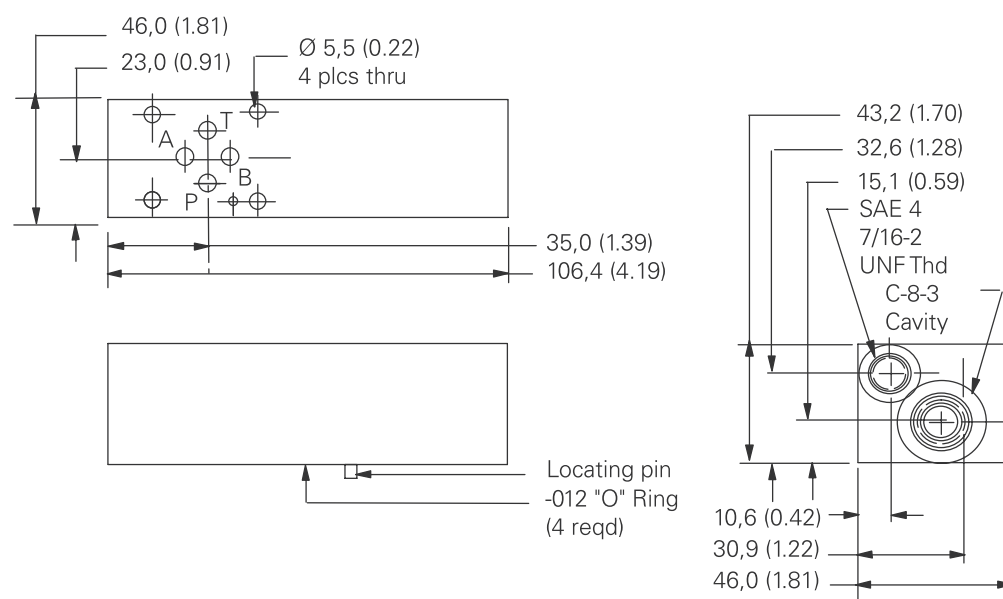
Cavity porting



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

A309W Housing kit

Part Number **02-185361**



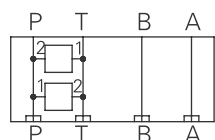
Typical cartridges

Function

DSV2-8-B-0

Shuttle valve A & B Output external

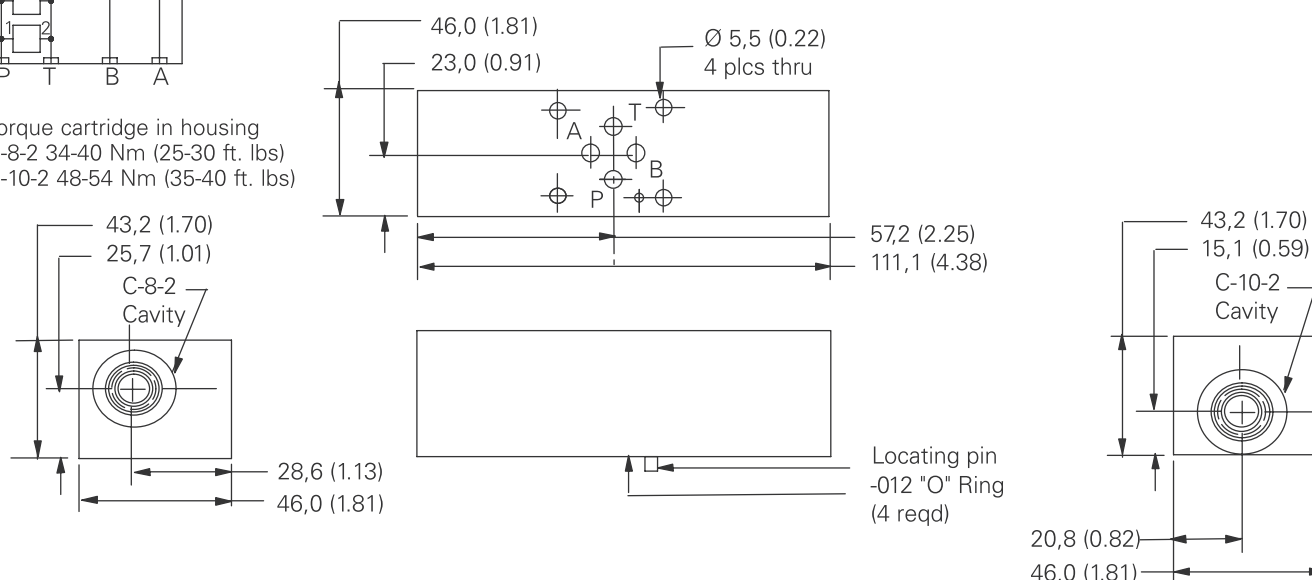
Cavity porting



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.

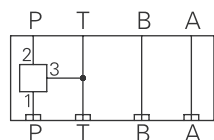
Dimensions

ISO 4401-03/CETOP03 Housing kits

Dimensions

mm (inch)

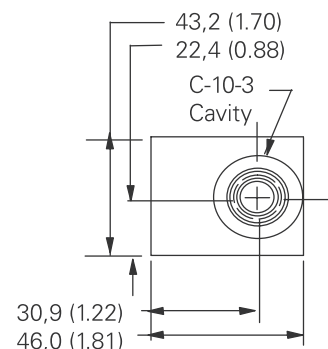
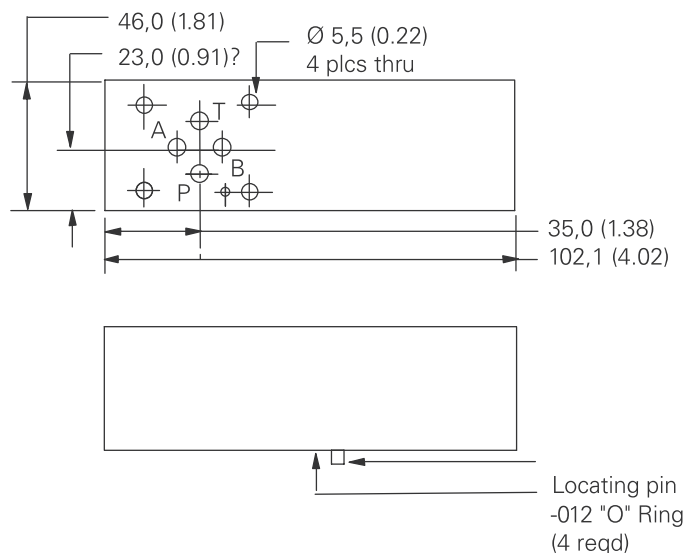
Cavity porting



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

A316P Housing kit

Part Number **02-185374**



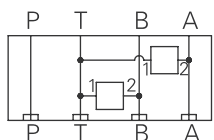
Typical cartridges

Function

PSV7-10

Sequence valve in to P

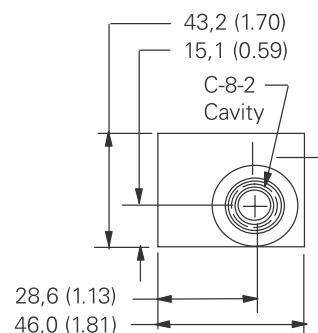
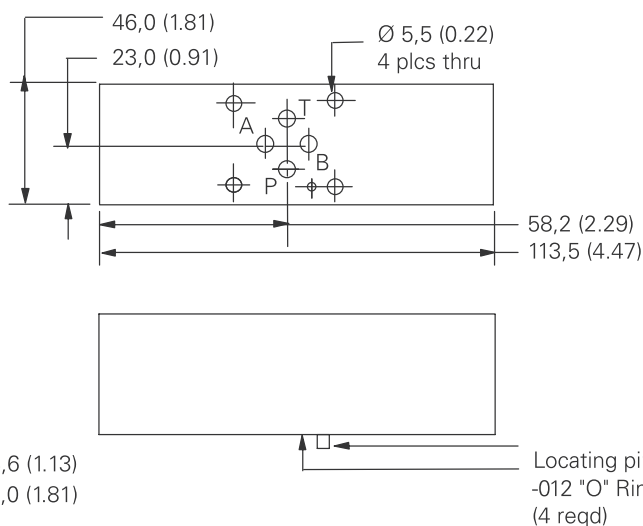
Cavity porting



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

A320T Housing kit

Part Number **02-185379**



Typical cartridges

Function

CV3-8

Check valve on T to A & B

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

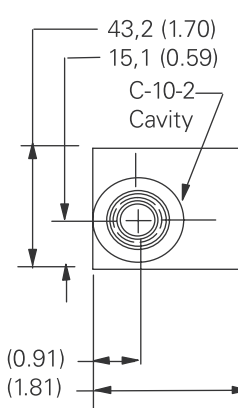
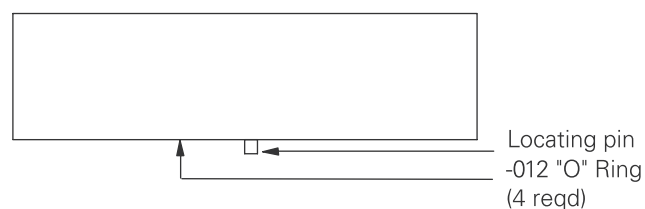
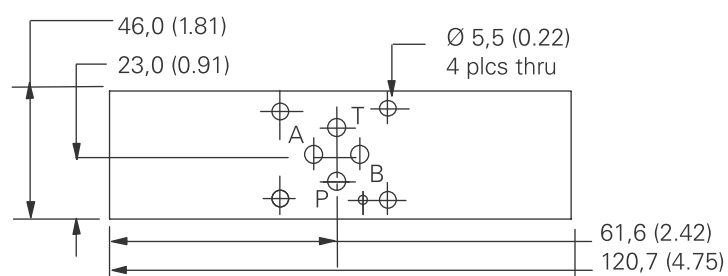
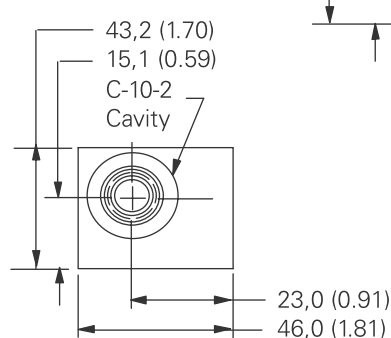
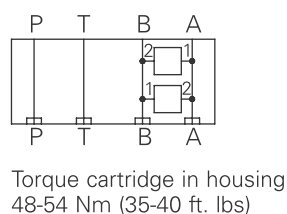
Dimensions

mm (inch)

A321W Housing kit

Part Number **02-185343**

Cavity porting



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

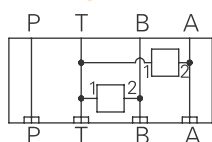
Dimensions

mm (inch)

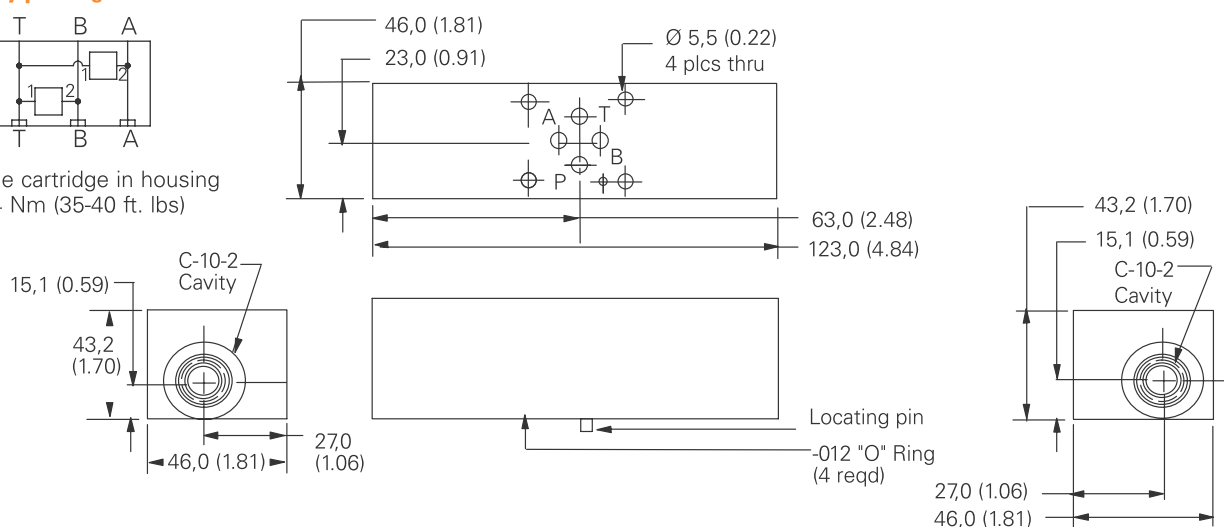
A317A Housing kit

Part Number **02-185375**

Cavity porting



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



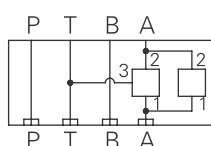
Note: This housing may require the use of a spacer block 02-185273 depending upon cartridge valve selection.

Typical cartridges

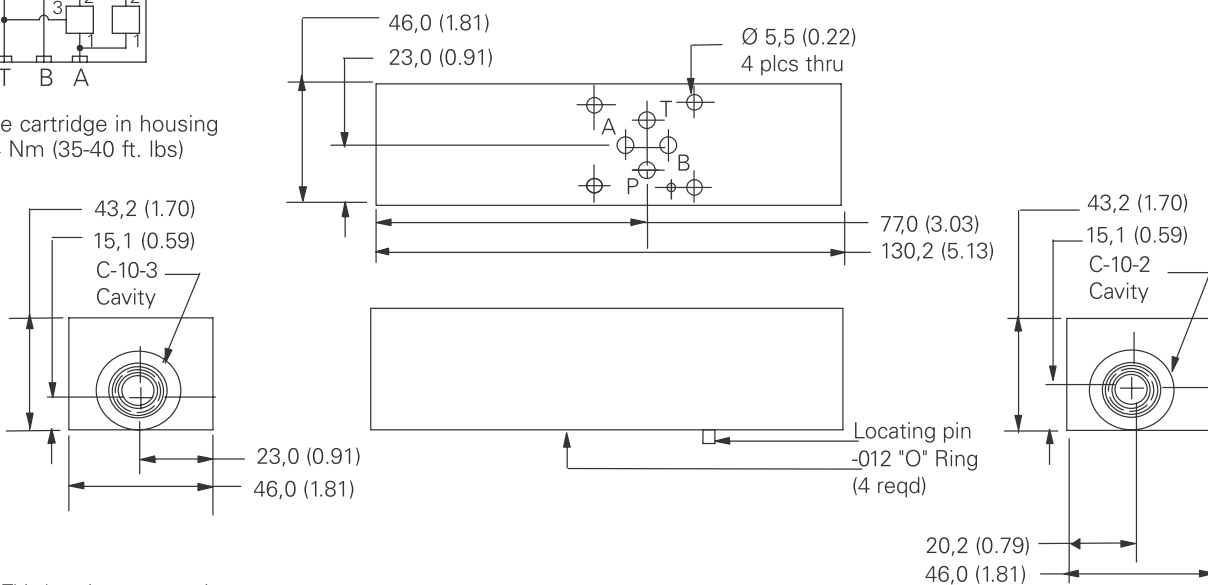
Function

CV3-10	Check valve on 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)



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

Typical cartridges

Function

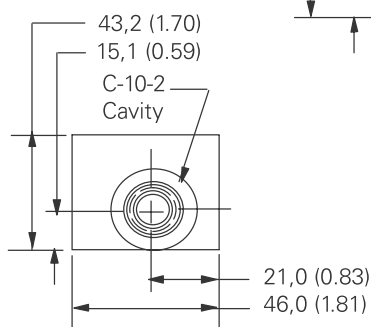
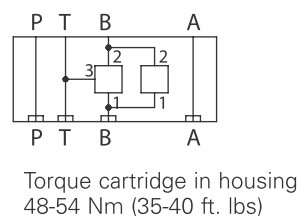
PRV2-10 & CV3-10-P-3	Reducing on A drained to T reverse free flow check
----------------------	--

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

Dimensions

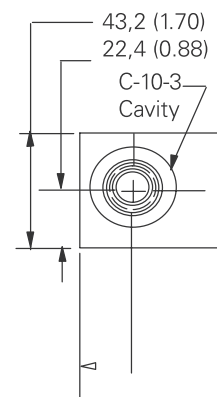
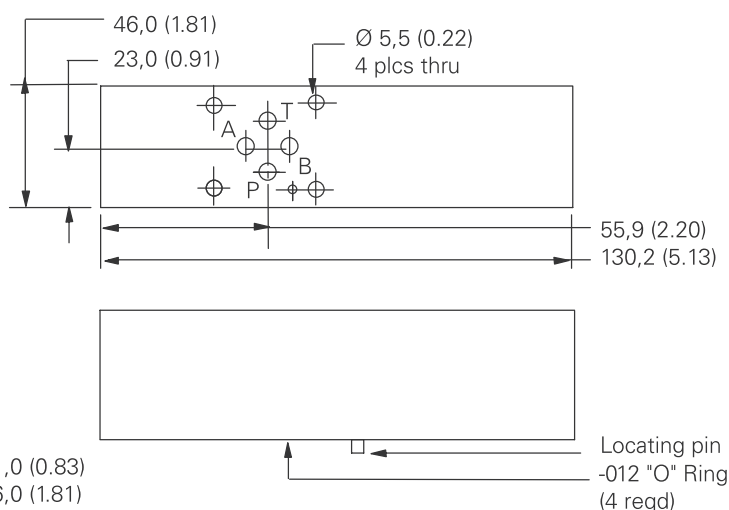
mm (inch)

Cavity porting



A310B Housing kit

Part Number **02-185363**



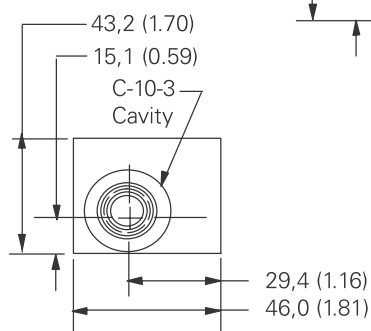
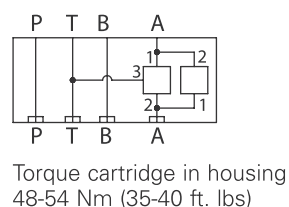
Typical cartridges

Function

PRV7-10 &
CV3-10-P-0-3

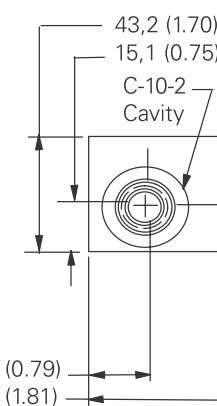
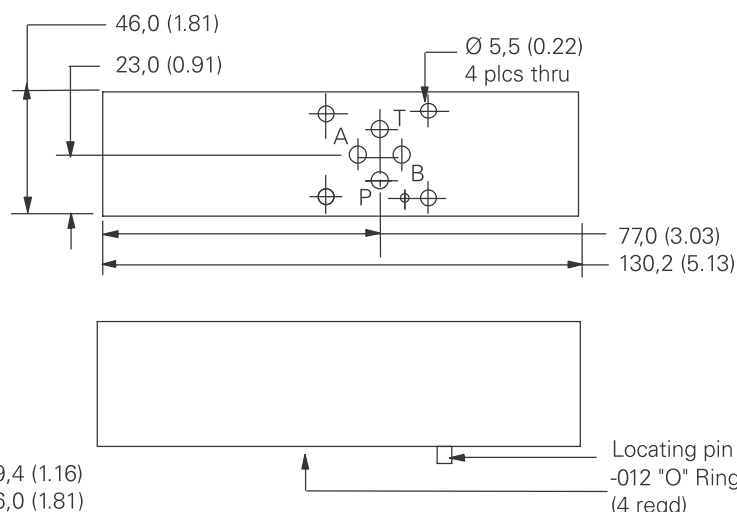
Reducing on B drained to T reverse free flow check

Cavity porting



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

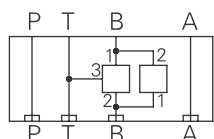
Dimensions

mm (inch)

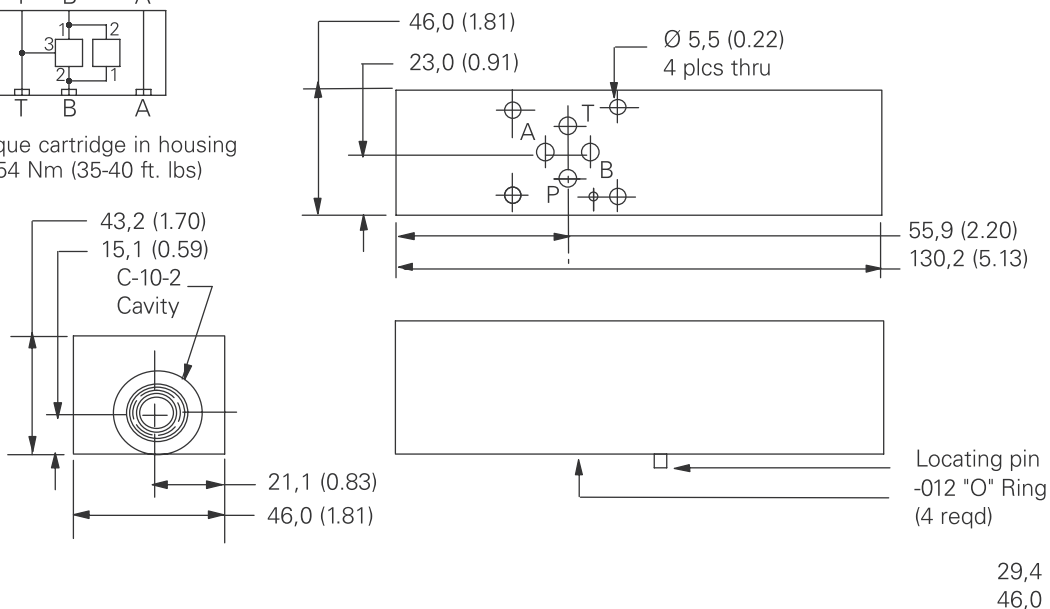
A316B Housing kit

Part Number **02-185373**

Cavity porting



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



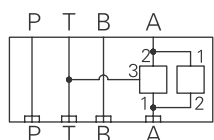
Typical cartridges

Function

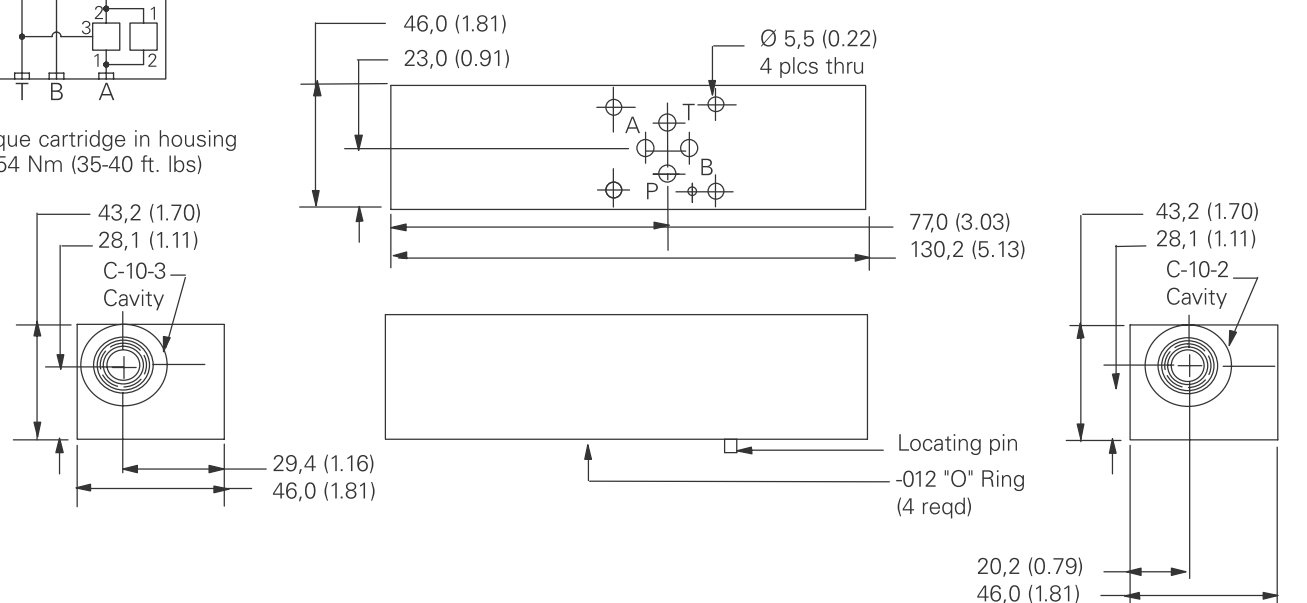
PSV7-10 &
CV3-10-P-0-3

Sequence valve in to B reverse free flow check

Cavity porting



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



Typical cartridges

Function

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

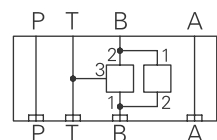
Sequence valve out of A reverse free flow check

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

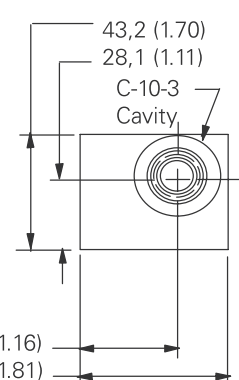
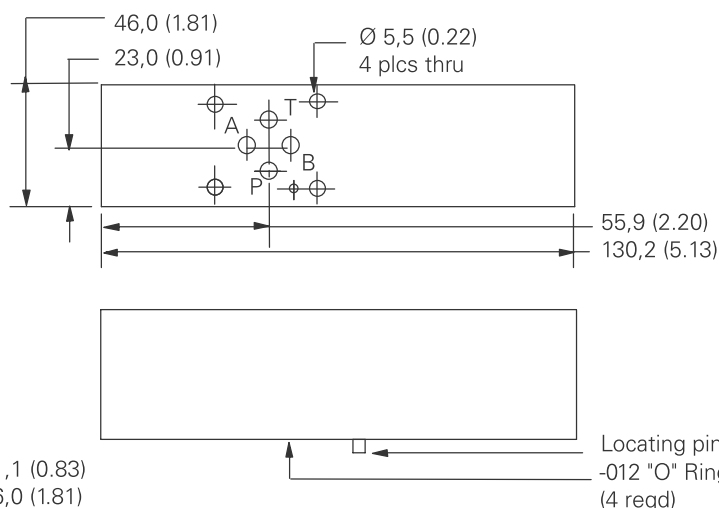
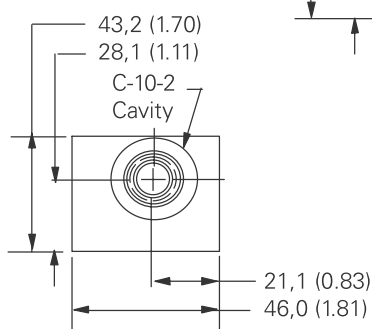
Dimensions

mm (inch)

Cavity porting



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



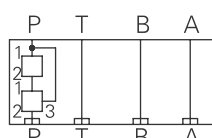
Typical cartridges

Function

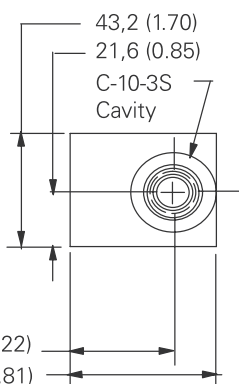
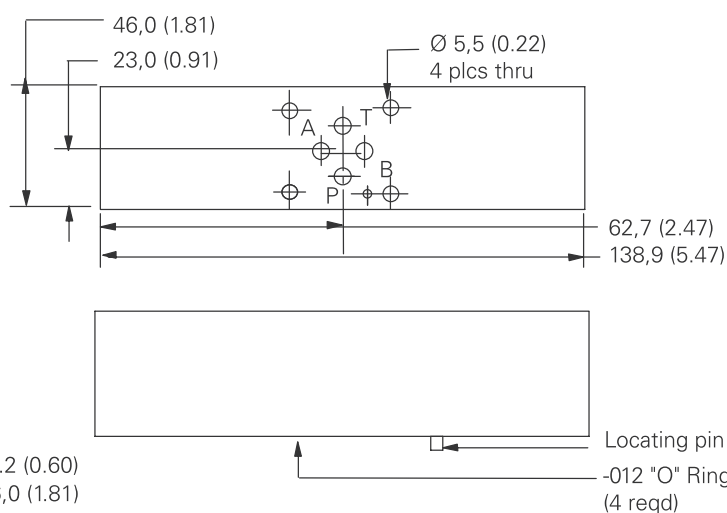
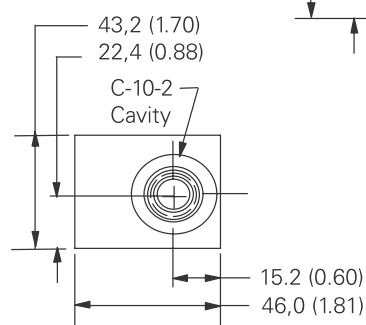
PSV7-10 &
CV3-10-P-0-3

Sequence valve out of B reverse free flow check

Cavity porting



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



Typical Cartridges

Function

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

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

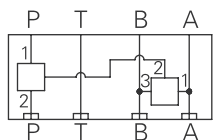
Dimensions

mm (inch)

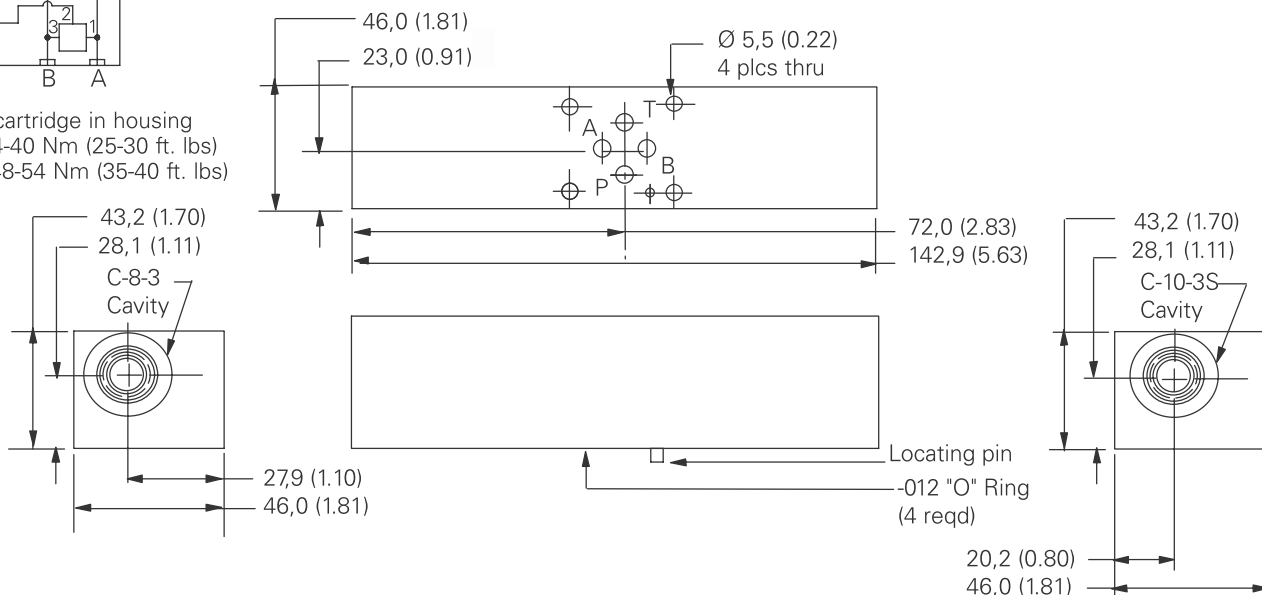
A309P Housing kit

Part Number **02-185381**

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)



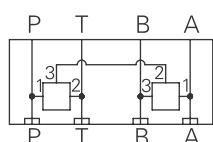
Typical cartridges

Function

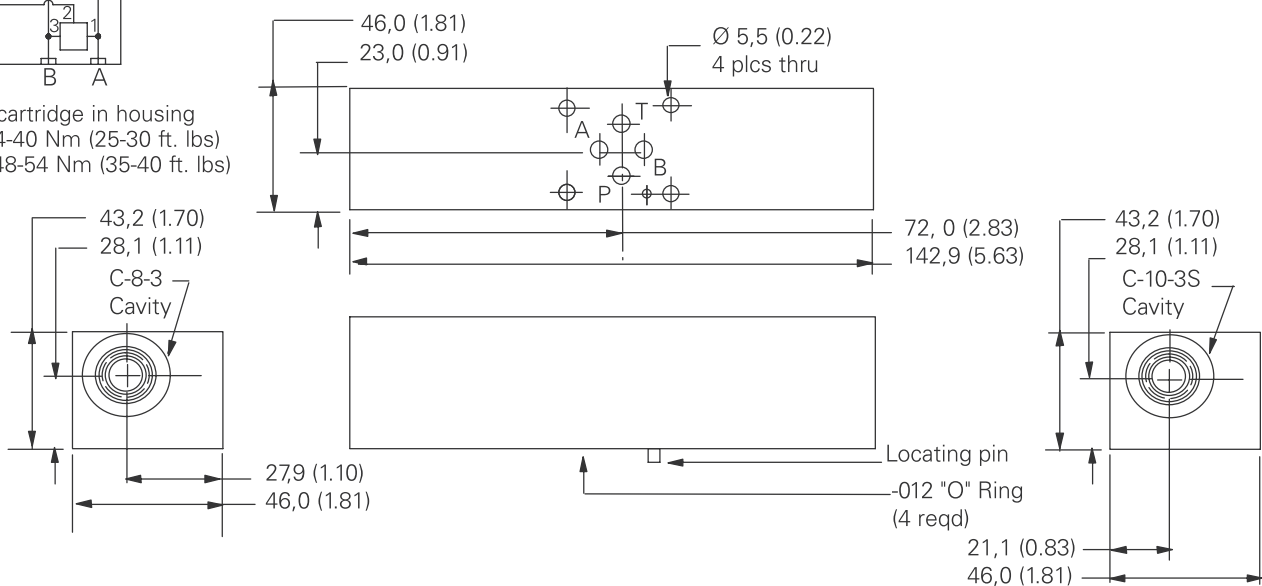
DPS2-10-F-F-0-* & DSV2-8-B-0

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)



Typical cartridges

Function

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

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

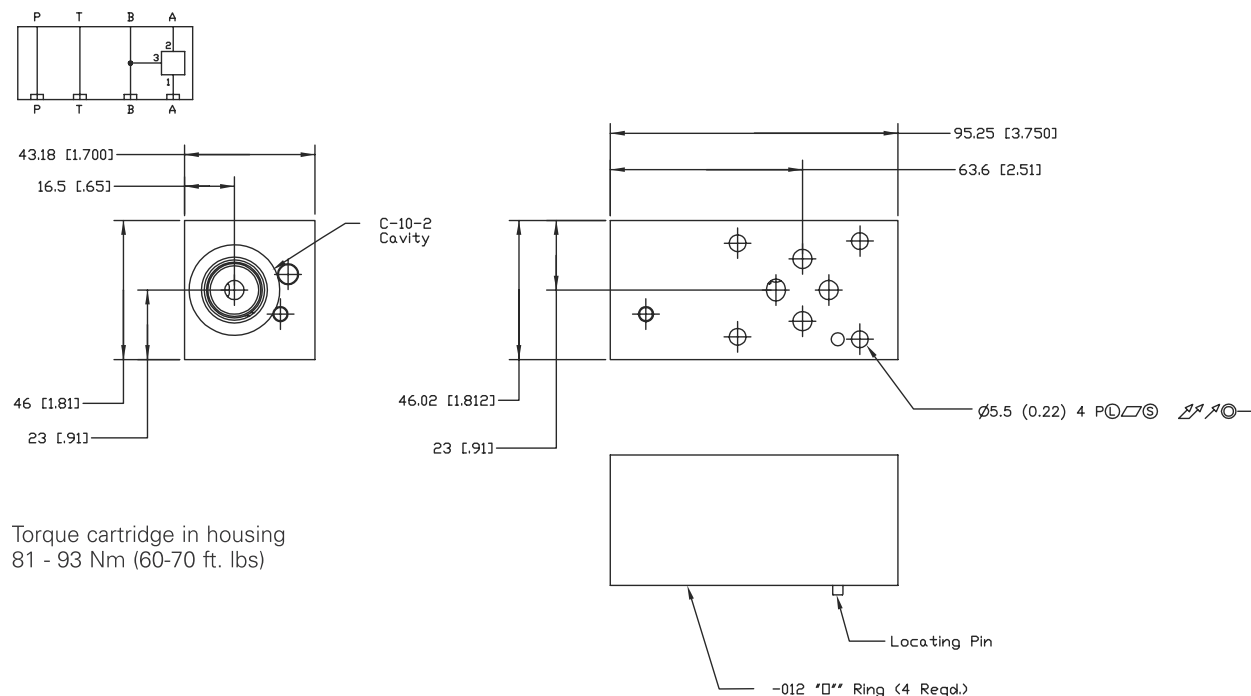
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

mm (inch)

A323A Housing kit

Part Number 6025820-001



Typical cartridges

Function

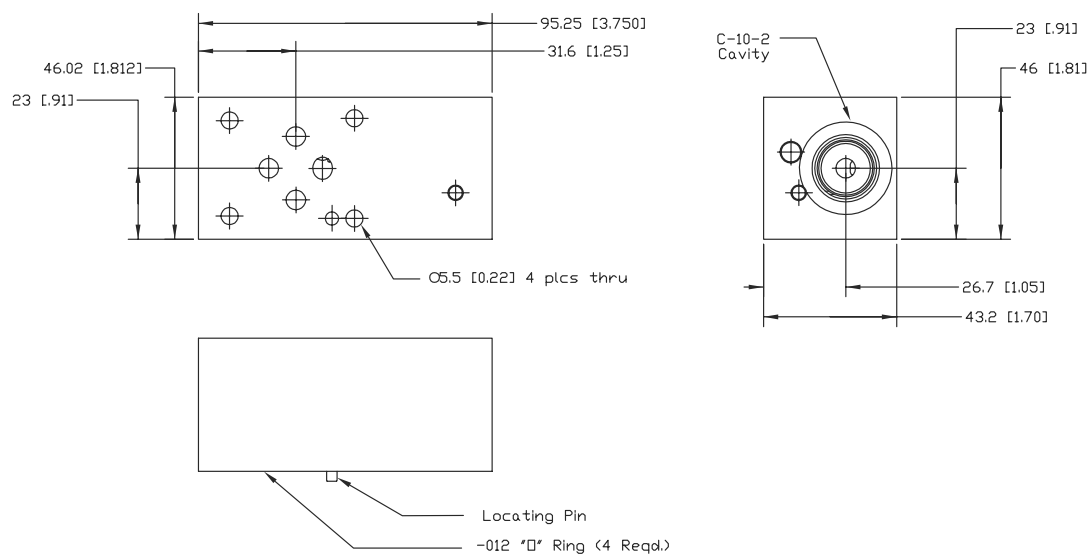
4CK30	PO Check Valve on A and Pilot from B
1CE30	Counterbalance Valve on A and Pilot from B

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

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

Dimensions

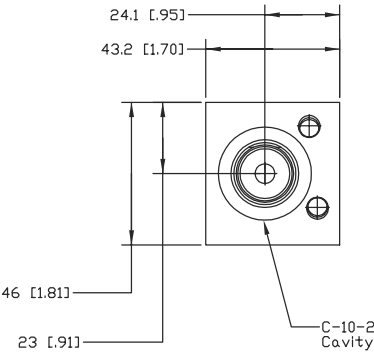
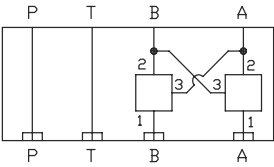
ISO 4401-03/CETOP03 Housing kits

Dimensions

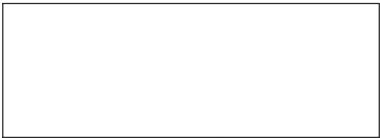
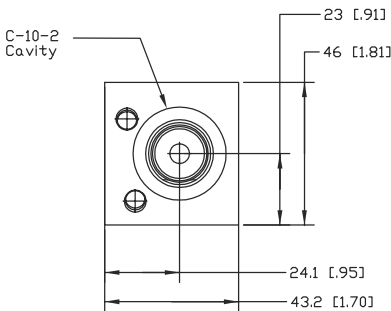
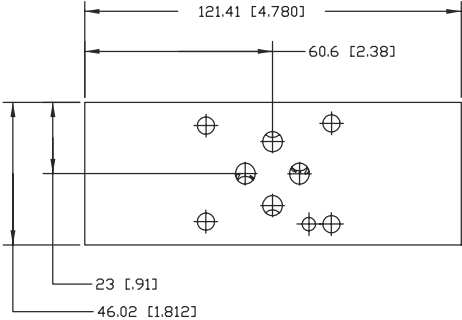
mm (inch)

A323W - Housing Kit

Part Number 6025822-001



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



Locating Pin

-012 O Ring (4 Req'd)

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



HYDRAULIC CONTROLS Pty Ltd



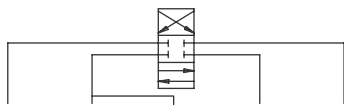
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Pressure control functions

Sandwich valves
ISO 05/DO5/NG 10/CETOP5 series

⚠ Caution

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

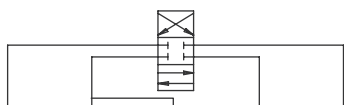


Function	Functional symbol	Model code	Housing kit	
Relief valve P-T		RV1-12**A521P**/****00	Model Part No.	A521P 6021302-001
Relief valve A-T		RV1-12**A521A**/****00	Model Part No.	A521A 6021299-001
Relief valve B-T		RV1-12**A521B**/****00	Model Part No.	A521B 6021295-001
Relief valve P-T		RV11-12**A521P**/****00	Model Part No.	A521P 6021302-001
Relief valve A-T		RV11-12**A521A**/****00	Model Part No.	A521A 6021299-001
Relief valve B-T		RV11-12**A521B**/****00	Model Part No.	A521B 6021295-001
Dual Relief valve A-T, B-T		RV1-10**A511W A**/**B**/**	Model Part No.	A511W 6021337-001
Dual Relief valve A-T, B-T		RV1-12**A512W A**/**B**/**	Model Part No.	A512W 6021184-001

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

Pressure control functions

Sandwich valves
ISO 05/DO5/NG 10/CETOP5 series



Function	Functional symbol					Model code	Housing kit	
Dual Relief Valve A-T, B-T	P	T	T	B	A	RV11-12**A512W A**/**B**/**	Model Part No.	A512W 6021184-001
							Cartridge Cartridge data sheet Cavity	RV11-12 [qty2] Section E C-12-2 [qty2]
Cross Port Relief Valve A-B						RV3-12**A521WA**/**B**/**	Model Part No.	A521W 6021158-001
							Cartridge Cartridge data sheet Cavity	RV3-12 [qty2] Section E C-12-2 [qty2]
Cross Port Relief Valve A-B						RV11-12**A521WA**/**B**/**	Model Part No.	A521W 6021158-001
							Cartridge Cartridge data sheet Cavity	RV11-12 [qty2] Section E C-12-2 [qty2]
Reducing Valve on P Drained to T						PRV12-12**A526P**/**00	Model Part No.	A526W 6021329-001
							Cartridge Cartridge data sheet Cavity	PRV12-12 Section E C-12-3
Reducing Valve on B Drained to T Reverse FF Check						PRV12-12** A510B**/**00	Model Part No.	A510B 6021352-001
							Cartridge Cartridge data sheet Cavity	PRV12-12/CV11-12 Section E & G C-12-3/C-12-2
	P	T	T	B	A			

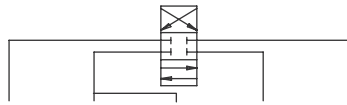
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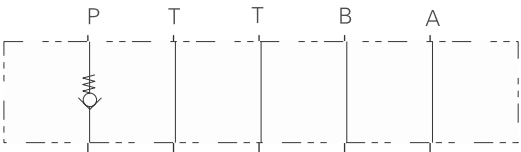
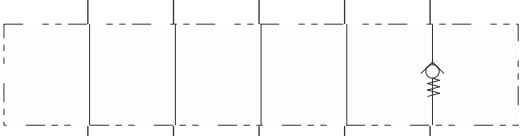
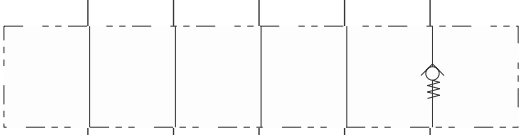
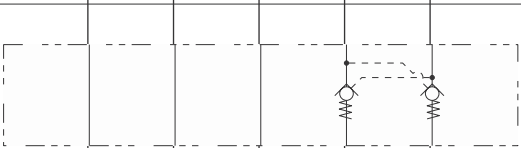
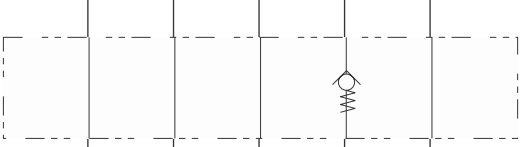
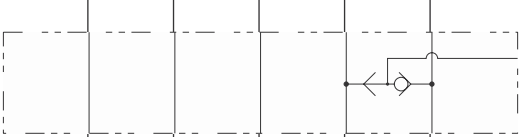
Check functions

Sandwich valves
ISO 05/DO5/NG 10/CETOP5 series

Caution

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

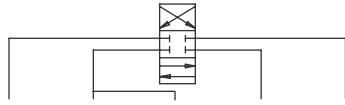


Function	Functional symbol	Model code	Housing kit	
Check Valve on P		CV11-12*P A524P***00	Model Part No.	A524P 6021186-001
Check Valve on A Free Flow Out		CV3-10*P A507A***00	Model Part No.	A507A 6021185-001
Check Valve on A Free Flow out		CV11-12*P A514A ***00	Model Part No.	A514A 6021288-001
Check in A Piloted from B		4CK90*A523A***00	Model Part No.	A523A 6021282-001
Check in A & B Cross Piloted		4CK90*A523W***00	Model Part No.	A523W 5999906-001
Check Valve on B Free Flow out		CV11-12*P A514B ***00	Model Part No.	A514B 6021273-001
Shuttle Valve A and B Output External		DSV2-8*B A509W 00	Model Part No.	A509W 6021189-001

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

Flow control functions

Sandwich valves
ISO 05/DO5/NG 10/CETOP5 series



Function	Functional symbol					Model code	Housing kit	
Flow Regulator Pressure Compensated and Check Meter in P		P	T	T	B	A	FAR1-12** A524P ***00	Model Part No. A524P 6021186-001 Cartridge Cartridge data sheet Cavity FAR1-12 Section H C-12-2
Flow Regulator Pressure Compensated and Check Meter in A							FAR1-12** A514A ***00	Model Part No. A514A 6021288-001 Cartridge Cartridge data sheet Cavity FAR1-12 Section H C-12-2
Flow Regulator Pressure Compensated and Check meter out A							FAR1-12** A524A ***00	Model Part No. A524A 6021181-001 Cartridge Cartridge data sheet Cavity FAR1-12 Section H C-12-2
Flow Regulator Pressure Compensated and Check meter in B							FAR1-12** A514B ***00	Model Part No. A514B 6021273-001 Cartridge Cartridge data sheet Cavity FAR1-12 Section H C-12-2
Flow Regulator Pressure Compensated and Check meter out B							FAR1-12** A524B ***00	Model Part No. A524B 6021182-001 Cartridge Cartridge data sheet Cavity FAR1-12 Section H C-12-2
Flow Regulator Pressure Compensated and Check meter in A & B							FAR1-12** A514W A***B***00	Model Part No. A514W 4998388-001 Cartridge Cartridge data sheet Cavity FAR1-12 qty 2 Section H C-12-2 qty 2
Flow Regulator Pressure Compensated and Check meter out A & B							FAR1-12** A524W A***B***00	Model Part No. A524W 4998389-001 Cartridge Cartridge data sheet Cavity FAR1-12 qty 2 Section H C-12-2 qty 2

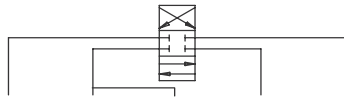
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Solenoid control functions

Sandwich valves
ISO 05/DO5/NG 10/CETOP5 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	
Solenoid 2/2 Poppet type (P-T) Normally Closed		SV3-12*C A525P *** *00	Model Part No.	A525P 6021293-001
Solenoid 2/2 Poppet type (P-T) Normally Open		SV3-12*0 A525P *** *00	Model Part No.	A525P 6021273-001
Solenoid 2/2 Poppet type Blocked on A Normally Closed		SV3-12*C A524A *** *00	Model Part No.	A524A 6021181-001
Solenoid 2/2 Poppet type Blocked on A Normally Open		SV3-12*0 A524A *** *00	Model Part No.	A524A 6021181-001
Poppet type Blocked on B Normally Closed		SV3-12*C A524B *** *00	Model Part No.	A524B 6021182-001
Poppet type Blocked on B Normally Open		SV3-12*0 A524B *** *00	Model Part No.	A524B 6021182-001
Poppet type Load Holding on A & B Normally Closed		SV3-12*C A524W *** *00	Model Part No.	A524W 4998379-001
Poppet type Load Holding on A & B Normally Closed		SV3-12*0 A524W *** *00	Model Part No.	A524W 4998379-001
Poppet type Load Holding on A Normally Closed		SV3-12*C A514A *** *00	Model Part No.	A514A 6021288-001
Poppet type Load Holding on A Normally Open		SV3-12*0 A514A *** *00	Model Part No.	A514A 6021288-001
Poppet type Load Holding on B Normally Open		SV3-12*0 * A514A *** *00	Model Part No.	A514A 6021288-001

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

⚠ Caution

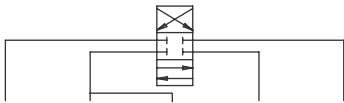
Sandwich valve flow ratings are limited by the ratings of individual cartridges. Consult cartridge valve literature.

Function	Functional symbol	Model code	Housing kit	
Poppet type Load Holding on B Normally Closed		SV3-12-C A514B *** *00	Model Part No.	A514B 6021273-001
Poppet type Load Holding on B Normally Open		SV3-12*0 A514B *** *00	Model Part No.	A514B 6021273-001
Poppet type Load Holding on A & B Normally Closed		SV3-12*C A514W *** *00	Model Part No.	A514W 4998388-001
Poppet type Load Holding on A & B Normally Closed		SV3-12*0 A514W*** *00	Model Part No.	A514W 4998388-001
Poppet Bi-Directional Load Holding on A Normally Closed		SBV11-10*C A514A *** *00	Model Part No.	A514A 6021181-001
Poppet Bi-Directional Load Holding on A Normally Open		SBV11-10*0 A514A *** *00	Model Part No.	A514A 6021181-001
Poppet Bi-Directional Load Holding on B Normally Closed		SBV11-10*C A514B *** *00	Model Part No.	A514B 6021273-001
Poppet Bi-Directional Load Holding on B Normally Open		SBV11-10*0 A514B *** *00	Model Part No.	A514B 6021273-001
Poppet Bi-Directional Load Holding on A & B Normally Clc		SBV11-12*C A514W *** *00	Model Part No.	A514W 4998388-001
Poppet Bi-Directional Load Holding on A & B Normally Open		SBV11-12*0 A514W *** *00	Model Part No.	A514W 4998388-001
Poppet Bi-Directional Blocked A and B Normally Closed		SBV11-12*C A518W *** *00	Model Part No.	A518W 6021277-001
Poppet Bi-Directional Blocked A and B Normally Open		SBV11-12*0 A518W *** *00	Model Part No.	A518W 6021277-001
Solenoid 3-Way Selector on P		SV11-12*3 A526P *** *00	Model Part No.	A526P 6021329-001

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

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	
	P	T	T	B	A			
Overcenter in A Pilot from B						1CE90 * A523AA 20S/*B20S/** **	Model Part No.	A523A 6021282-001
							Cartridge Cartridge Data Sheet Cavity	1CE90 Section F A12336
Overcenter in A & B Cross Piloted						1CE90 * A523WA 20S/*B20S/** **	Model Part No.	A523W 5999906-001
							Cartridge Cartridge Data Sheet Cavity	1CE90 qty 2 Section F A12336 qty 2
	P	T	T	B	A			

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

**Caution**

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

Note: O-Rings to be ordered separately.

Blanking and linking plates

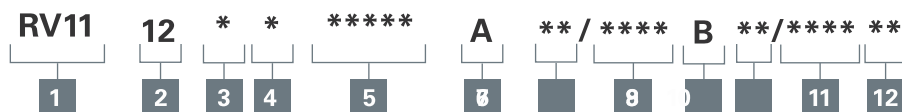
Function	Functional symbol	Part number
Blanking Plate		6030861-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000
Linking Plate P to A with B & T Blocked		6030883-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000
Linking Plate P to A & B to T		6030885-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000
Linking Plate P to B & A to T		6030887-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000
Linking Plate P to T with A & B Blocked		6030889-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000
Linking Plate A to B with P & T Blocked		6030891-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000
Linking Plate P to B with A & T Blocked		6030893-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000
Linking Plate P to A & B with T Blocked		6030895-001 Buna N O-Ring Kit 9900941-000 Viton O-Ring Kit 9900942-000

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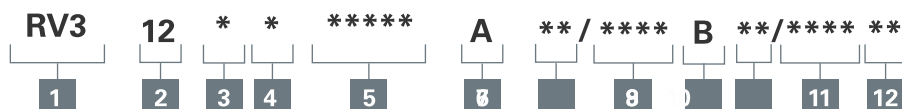
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model codes

For sandwich valve assemblies with two valves



1 Function RV11 - Relief valve	4 Adjustment C - Cap K - Knob S - Screw	7 Cracking pressure range 15 - 10-100 bar (150-1500 psi) 30 - 17-210 bar (250-3000 psi)	10 Cracking pressure range 15 - 10-100 bar (150-1500 psi) 30 - 17-210 bar (250-3000 psi)
2 Size 12 - 12 Size	5 Housing kit A512W - Dual A & B to T relief A521W - Cross port relief	8 Pressure setting User requested setting in psi	11 Pressure setting User requested setting in psi
3 Seals N - Buna-N V - Viton	6 A port acted upon	9 B port acted upon	12 Special features 00 - None

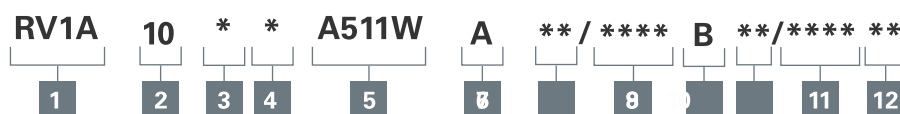


1 Function RV3 - Relief valve	4 Adjustment C - Cap F - Factory Set K - Knob S - Screw	7 Cracking pressure range 2.5 - 3.4 to 17 bar (50-250 psi) 8.5 - 13-55 bar (200-850 psi) 22 - 20-150 bar (300-2200 psi)	10 Cracking pressure range 2.5 - 3.4 to 17 bar (50-250 psi) 8.5 - 13-55 bar (200-850 psi) 22 - 20-150 bar (300-2200 psi)
2 Size 12 - 12 Size	5 Housing Kit A512W - Dual A & B to T relief A521W - Cross port relief	8 Pressure setting User requested setting in psi	11 Pressure setting User requested setting in psi
3 Seals N - Buna-N V - Viton	6 A port acted upon	9 B port acted upon	12 Special features User requested setting in psi

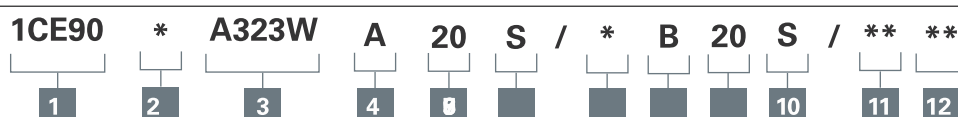
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model codes

For sandwich valve assemblies with two valves



1 Function RV1A - Relief valve	4 Adjustment C - Cap I - Internal F - Fixed K - Knob S - Screw	7 Cracking pressure range 3 - 3.5-20 bar (50-300 psi) 9 - 7-62 bar (100-900 psi) 18 - 17-124 bar (250-1800 psi) 30 - 34-210 bar (500-3000 psi)	10 Cracking pressure range 3 - 3.5-20 bar (50-300 psi) 9 - 7-62 bar (100-900 psi) 18 - 17-124 bar (250-1800 psi) 30 - 34-210 bar (500-3000 psi)
2 Size 10 - 10 Size	5 Housing kit	8 Pressure setting User requested setting in psi	11 Pressure setting User requested setting in psi
3 Seals N - Buna-N V - Viton®	6 A port acted upon	9 B port acted upon	12 Special features 00 - None

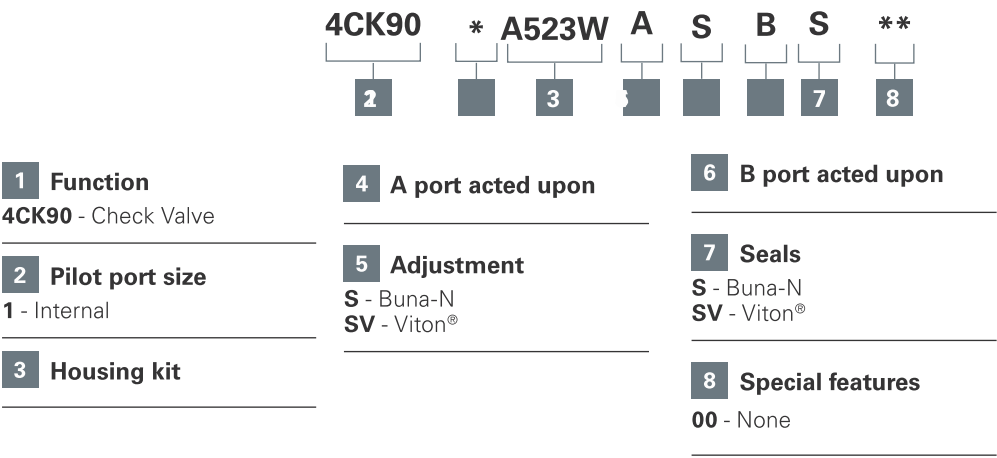


1 Pilot ratio/function 1CE30 - Overcenter	5 Pressure range 20 - 70-225 bar. Standard setting 100 bar Setting made at 4.8 L/min.	8 B port acted upon	11 Pilot ratio 4- 4:1 8- 8:1
2 Adjustment F - Screw N - Fixed	6 Seals S - Buna-N SV - Viton®	9 Pressure range 20 - 70-225 bar. Standard setting 100 bar Setting made at 4.8 L/min.	12 Special features 00 - None
3 Housing kit	7 Pilot ratio 4- 4:1 8- 8:1	10 Seals S - Buna-N SV - Viton®	

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

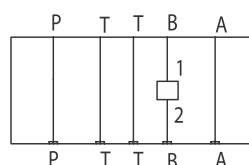


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

mm (inch)

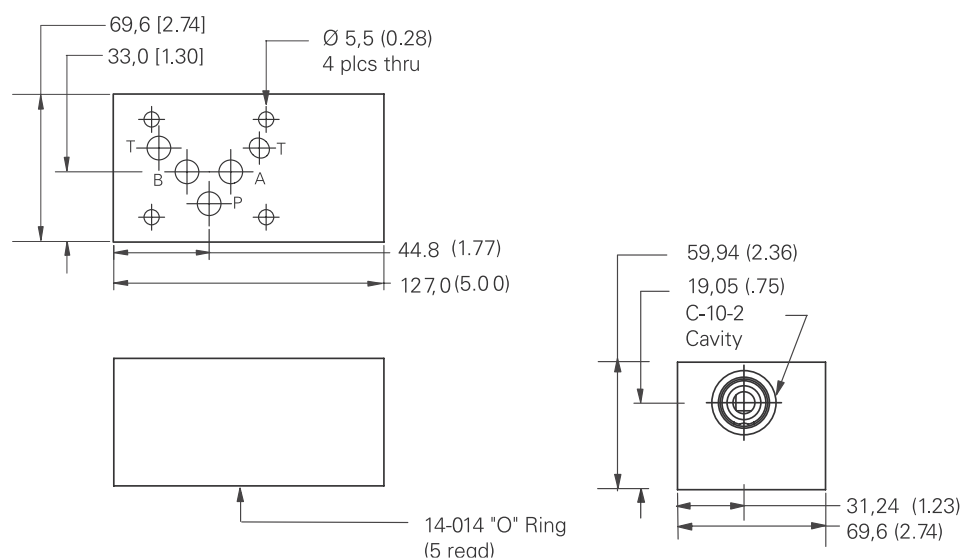
Cavity porting



Torque cartridge in housing
108-122 Nm (80-90 ft. lbs)

A507A Housing kit

Part Number 6021185-001



Typical Cartridges

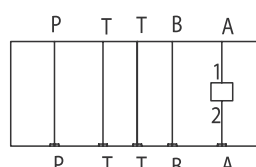
Function

CV3-10	Check valve on A, free flow out
--------	---------------------------------

Dimensions

mm (inch)

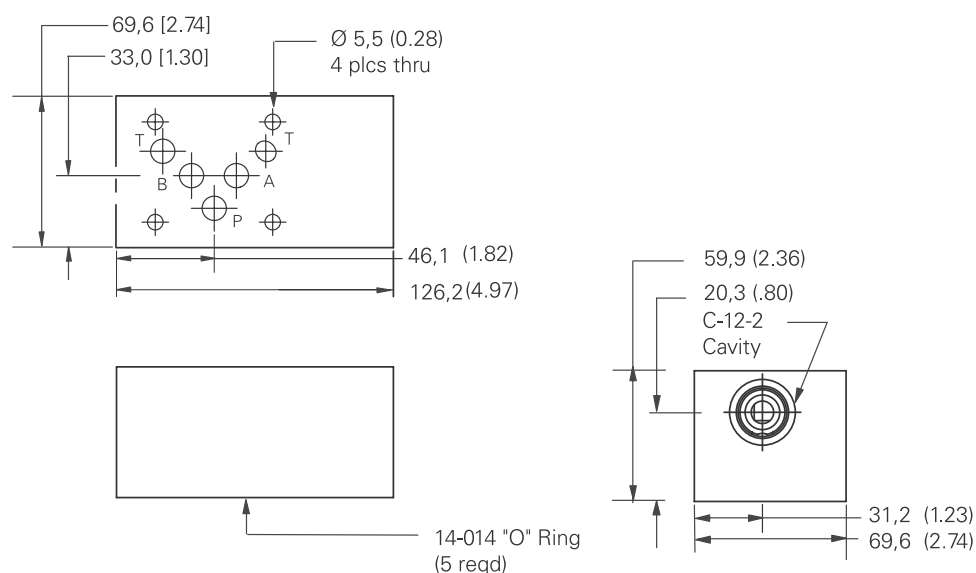
Cavity porting



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

A514A Housing Kit

Part Number 6021288-0 01



Typical Cartridges

Function

CV11-12	Check valve on A, Free Flow Out
FAR1-12	Flow regulator pressure compensated and check, Meter in A
SBV11-12-C	Solenoid 2-way poppet type bi-directional load holding on A, normally closed
SBV11-12-O	Solenoid 2-way poppet type bi-directional load holding on A, normally open
SV3-12-C	Solenoid 2-way poppet type load holding on A, normally closed
SV3-12-O	Solenoid 2-way poppet type load holding on A, normally open

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

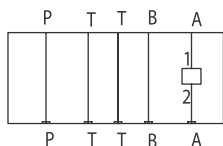
Dimensions

ISO 05/D05/NG 10/CETOP5 Housing kits

Dimensions

mm (inch)

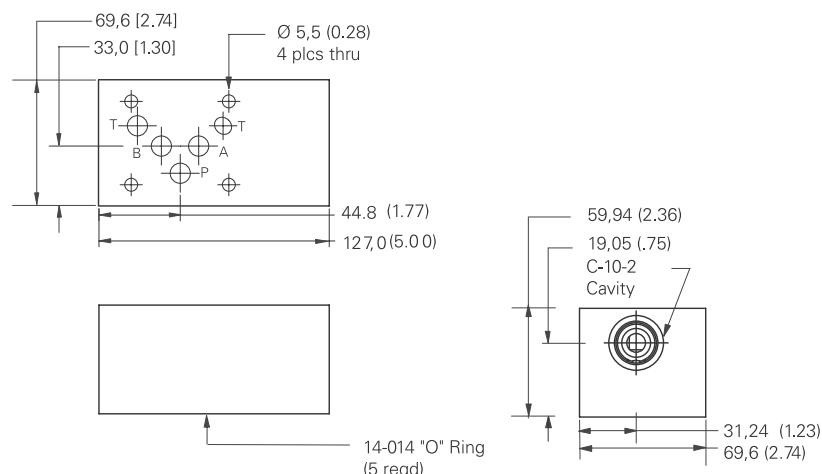
Cavity porting



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

A514B Housing Kit

Part Number **6021273-0 01**

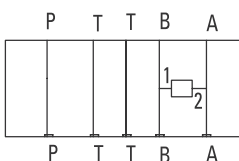


Typical Cartridges	Function
CV11-12	Check valve on B, Free Flow Out
FAR1-12	Flow Regulator pressure compensated and check, Meter in B
SBV11-12-C	SBV11-12-C Solenoid 2-way poppet type bi-directional load holding on B, normally closed
SBV11-12-O	SBV11-12-O Solenoid 2-way poppet type bi-directional load holding on B, normally open
SV3-12-C	Solenoid 2-way poppet type load holding on B, normally closed
SV3-12-O	Solenoid 2-way poppet type load holding on B, normally open

Dimensions

mm (inch)

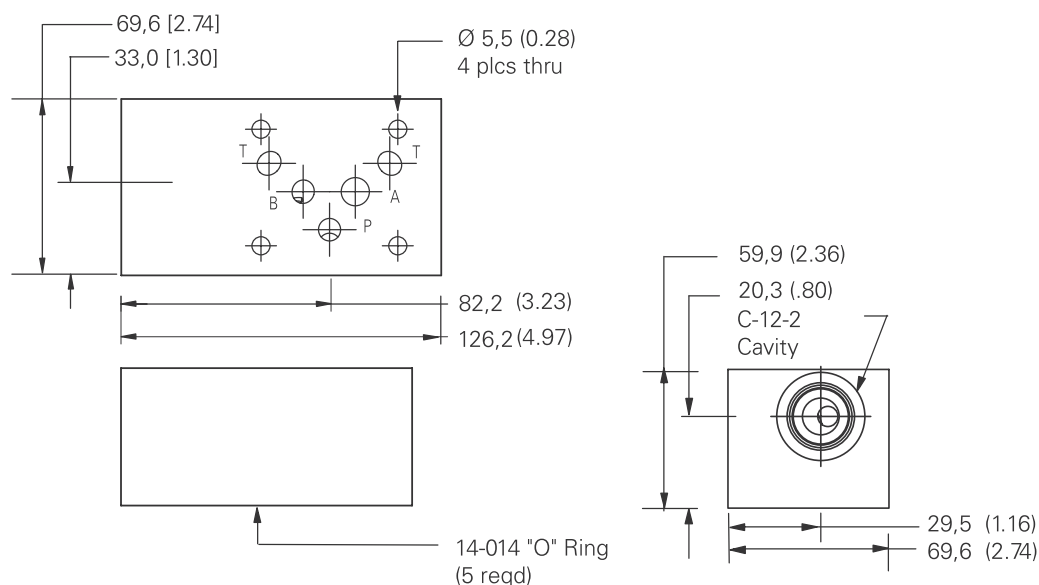
Cavity porting



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

A518W Housing kit

Part Number **6021277-001**



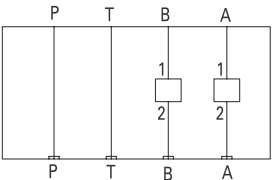
Typical cartridges	Function
SBV11-12-C	Solenoid 2-way poppet type bi-directional load holding on A-B & B-A, normally closed
SBV11-12-O	Solenoid 2-way poppet type bi-directional load holding on A-B & B-A, normally closed

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

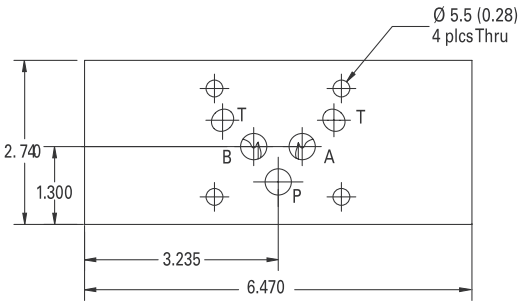
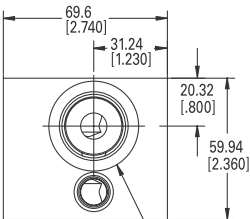
Dimensions

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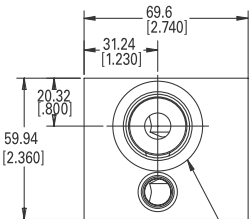
Cavity porting



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



14-014 "O" Ring (5 reqd)



Typical cartridges	Function
FAR1-12	Flow regulator pressure compensated and check, Meter in A
SBV11-12-C	Solenoid 2-way poppet type bi-directional load holding on A, normally closed
SBV11-12-0	Solenoid 2-way poppet type bi-directional load holding on A, normally open
SV3-12-C	Solenoid 2-way poppet type load holding on A, normally closed
SV3-12-0	Solenoid 2-way poppet type load holding on A, normally open

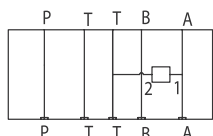
Dimensions

ISO 05/D05/NG 10/CETOP5 Housing kits

Dimensions

mm (inch)

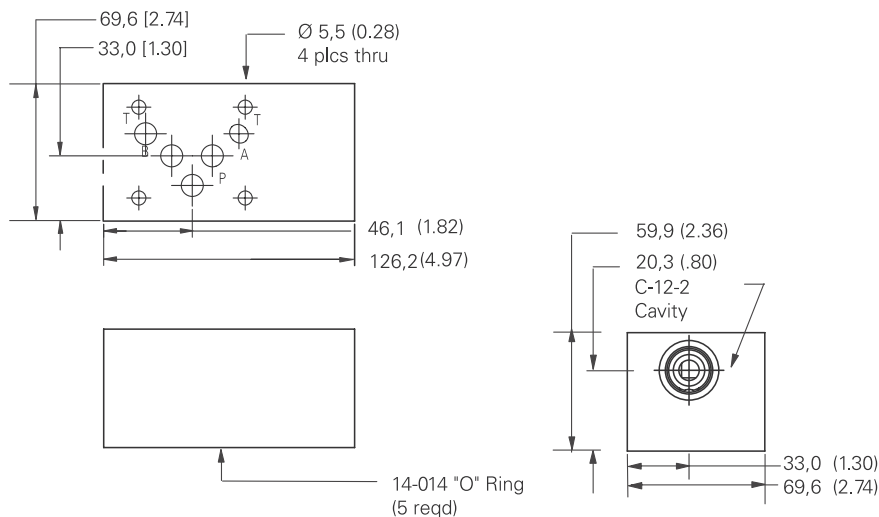
Cavity porting



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

A521A Housing kit

Part Number **6021299-0 01**



Typical cartridges

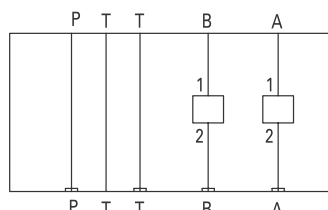
Function

RV1-12	Relief valve A-T
RV11-12	Relief valve A-T

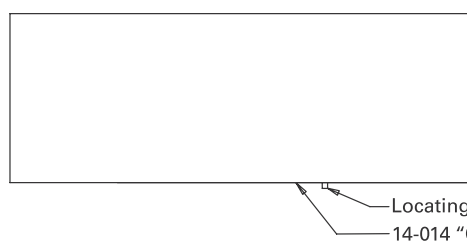
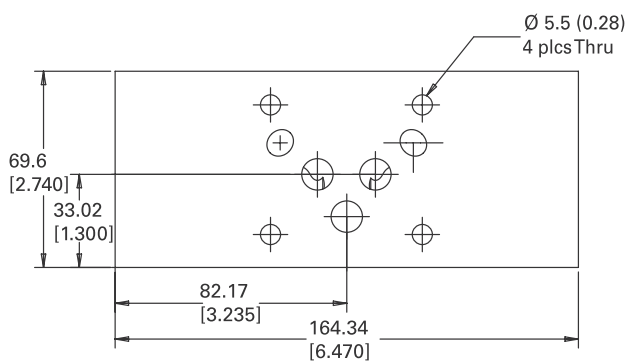
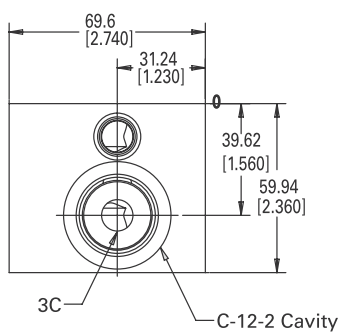
Dimensions

mm (inch)

Cavity porting



Torque cartridge in housing-



Typical cartridges

Function

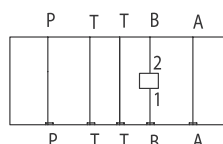
FAR1-12	Flow regulator pressure compensated and check, Meter in B
SV3-12-C	Solenoid 2-way poppet type load holding on B, normally closed
SV3-12-O	Solenoid 2-way poppet type load holding on B, normally open

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

Dimensions

mm (inch)

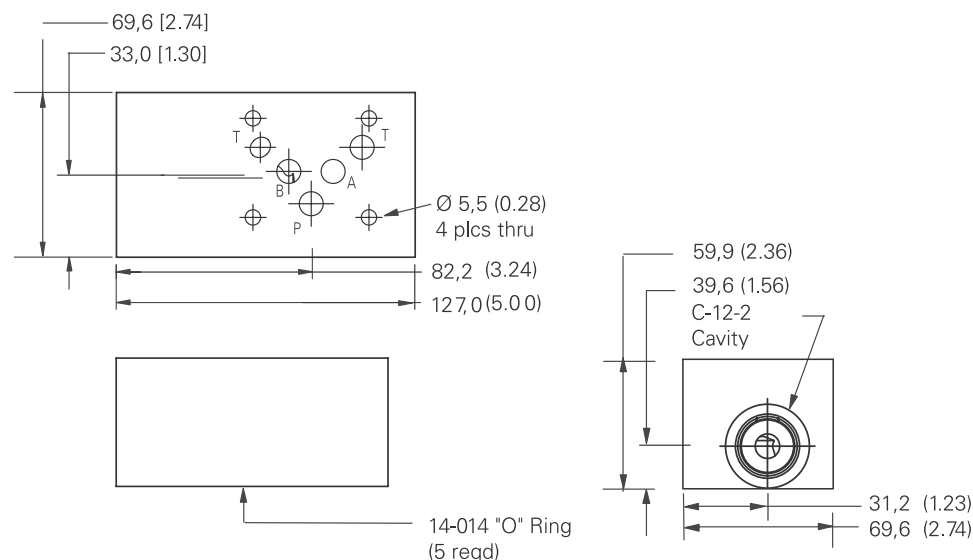
Cavity porting



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

A524B Housing kit

Part Number 6021282-0 01



Typical cartridges

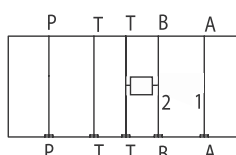
Function

FAR1-12	Flow regulator pressure compensated and check, Meter in B
SV3-12-C	Solenoid 2-way poppet type load holding on B, normally closed
SV3-12-O	Solenoid 2-way poppet type load holding on B, normally open

Dimensions

mm (inch)

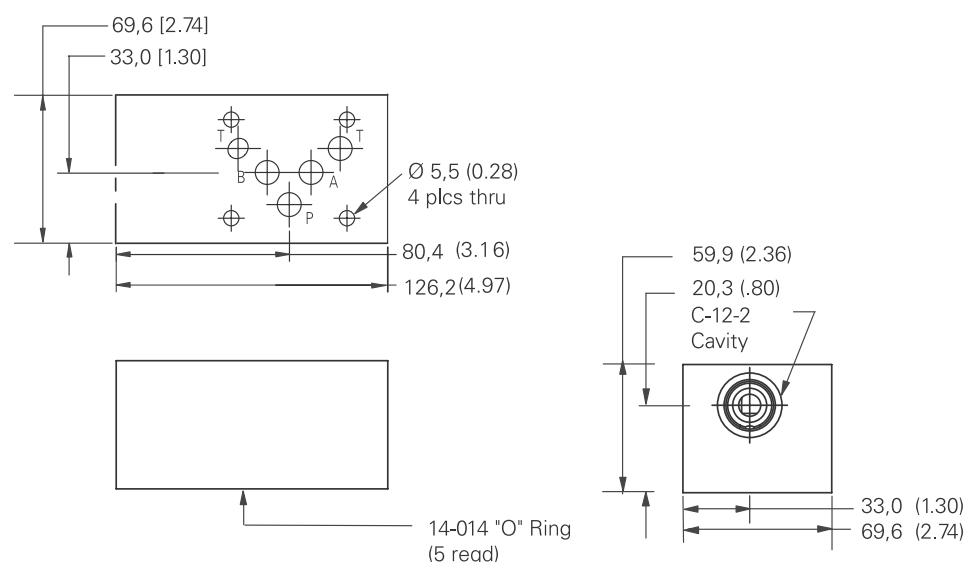
Cavity porting



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

A521B Housing kit

Part Number 6021295-0 01



Typical cartridges

Function

RV1-12	Relief valve B-T
RV11-12	Relief valve B-T

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

Dimensions

ISO 05/D05/NG 10/CETOP5 Housing kits

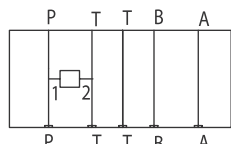
Dimensions

mm (inch)

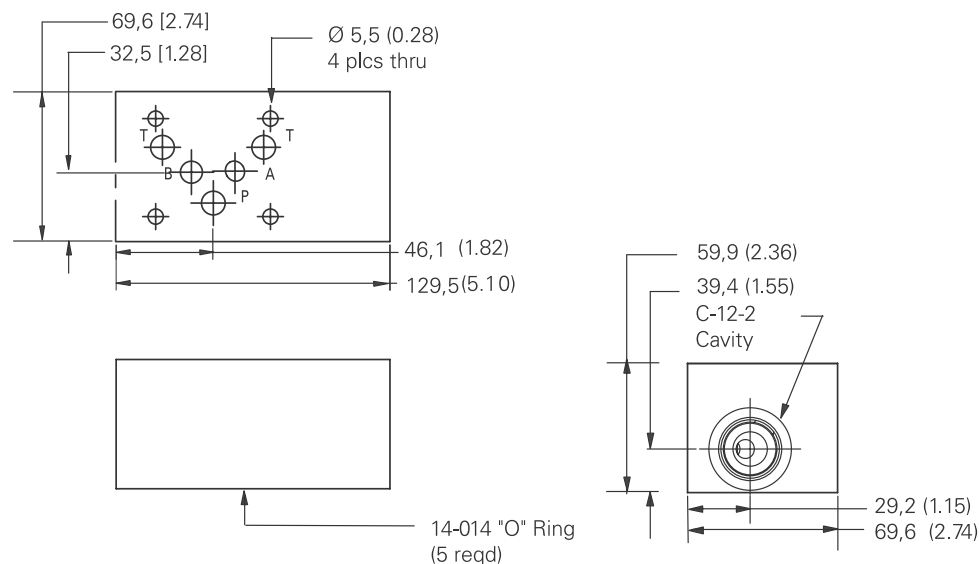
A521P Housing kit

Part Number 6021302-0 01

Cavity porting



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



Typical cartridges

Function

RV1-12	Relief valve P-T
RV11-12	Relief valve P-T

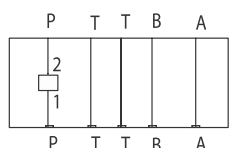
Dimensions

mm (inch)

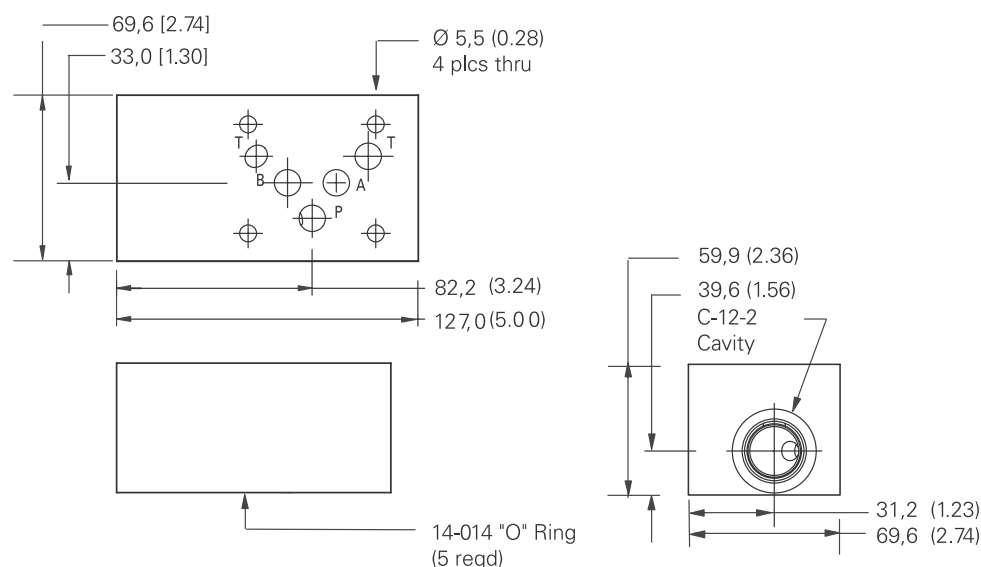
A524P Housing kit

Part Number 6021186-001

Cavity porting



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



Typical cartridges

Function

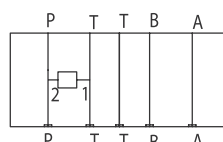
CV11-12	Check vavle on P
FAR1-12	Flow regulator pressure compensated, meter in P

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

Dimensions

mm (inch)

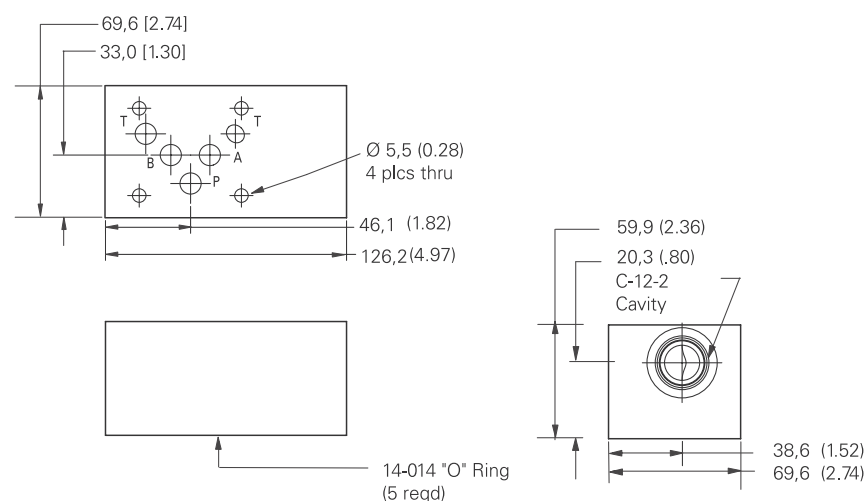
Cavity porting



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

A525P Housing kit

Part Number 6021293-0 01



Typical cartridges

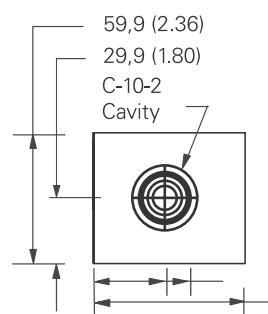
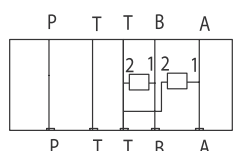
Function

SV3-12-C	Solenoid 2-way poppet type P-T, normally closed
SV3-12-O	Solenoid 2-way poppet type P-T, normally open

Dimensions

mm (inch)

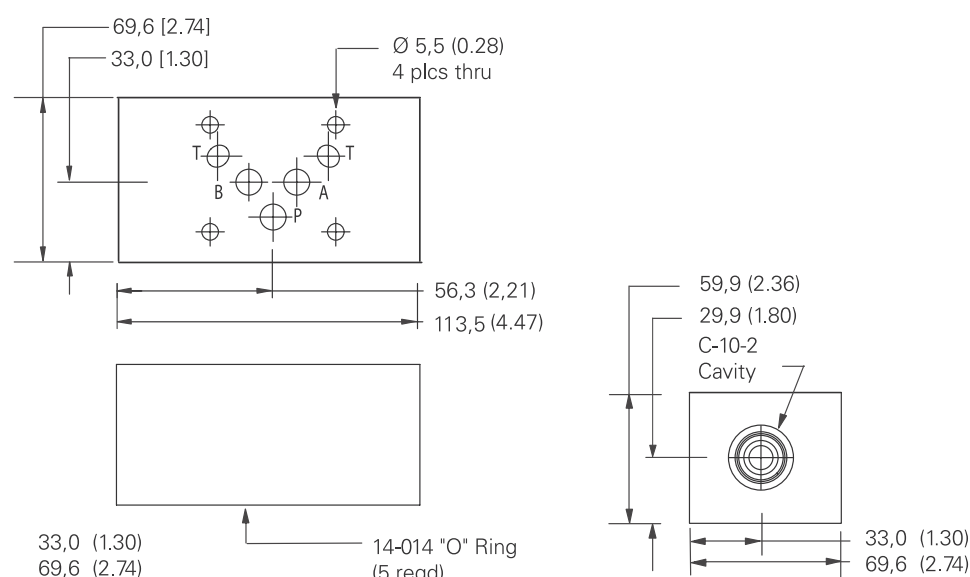
Cavity porting



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

A511W Housing kit

Part Number 4998388-001



Typical cartridges

Function

RV1-10	Dual relief valve A-T, B-T
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Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

ISO 05/D05/NG 10/CETOP5 Housing kits

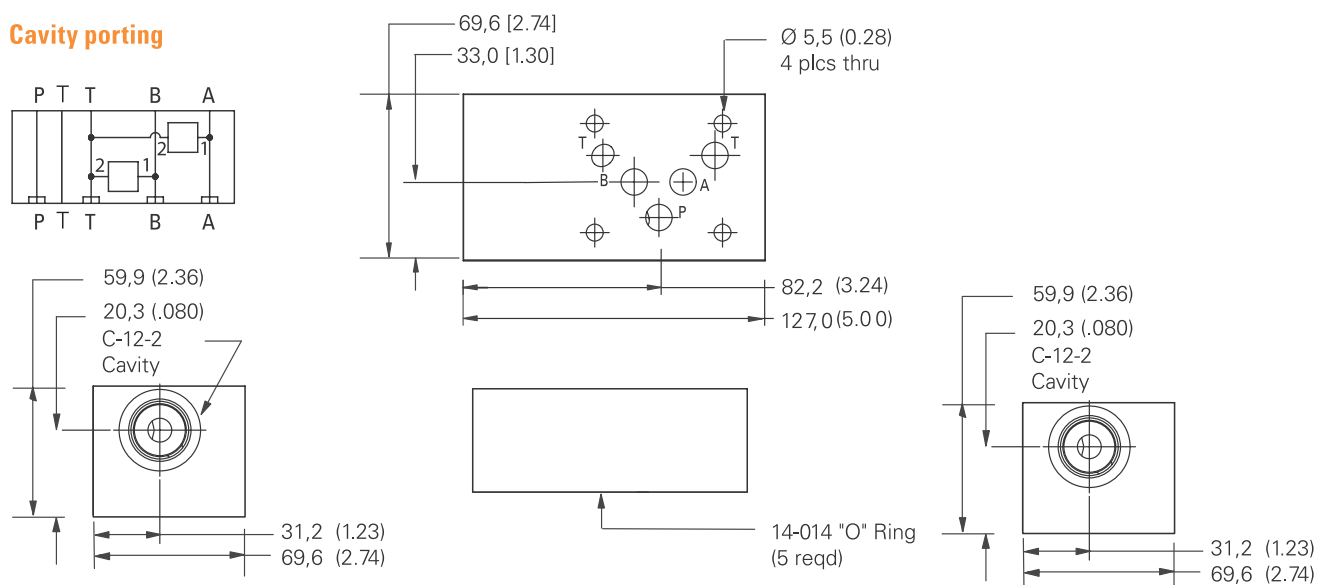
Dimensions

mm (inch)

A512W Housing kit

Part Number 6021184-001

Cavity porting



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

Typical cartridges

Function

RV1-12	Dual relief valve A-T, B-T
RV11-12	Dual relief valve A-T, B-T

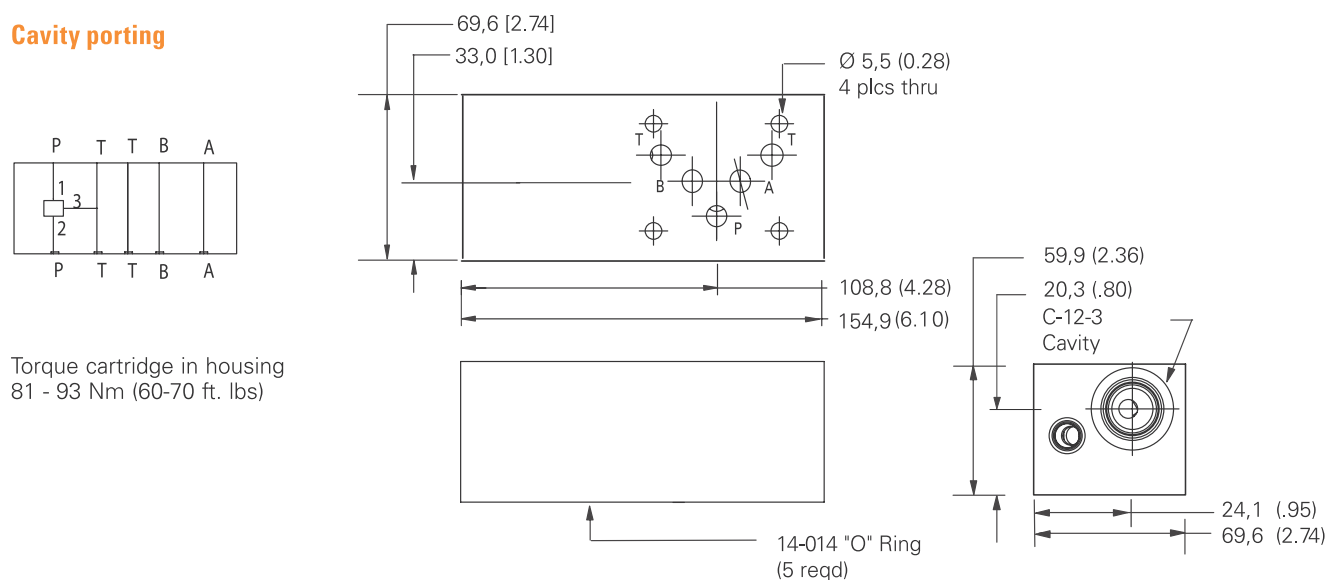
Dimensions

mm (inch)

A526P Housing kit

Part Number 6021158-0 01

Cavity porting



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

Typical cartridges

Function

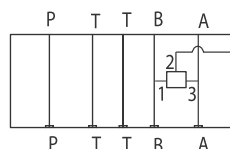
PRV12-12	Reducing valve (P) drained to T
SV11A-12-3	Solenoid 3-way selector P

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

Dimensions

mm (inch)

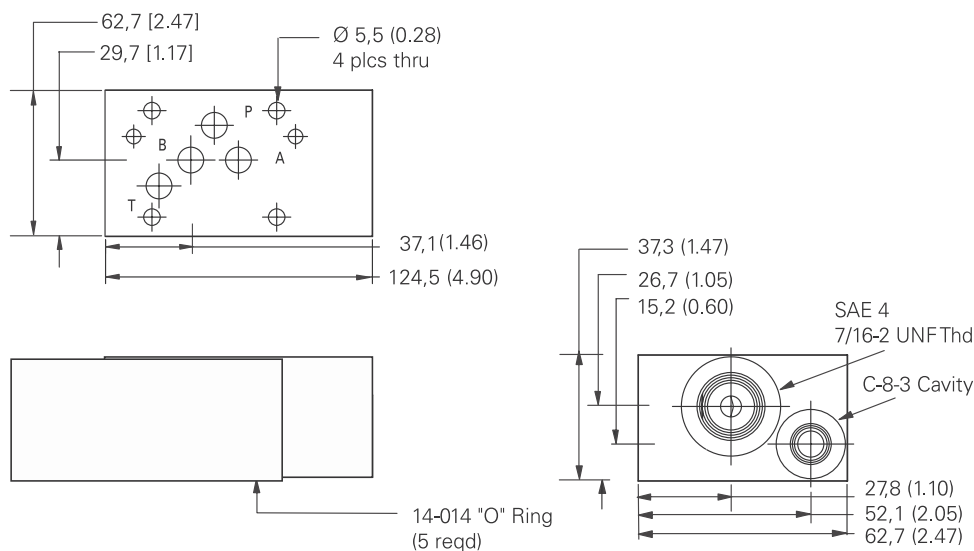
Cavity porting



Torque cartridge in housing
8.1 -13.6 Nm (6-10 ft. lbs)

A509W Housing kit

Part Number 6021189-001



Typical cartridges

Function

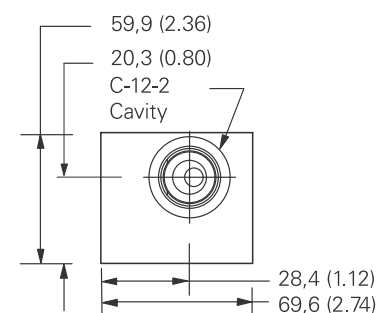
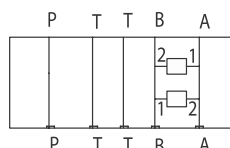
DSV2-8-B-0

Shuttle valve A & B Output external

Dimensions

mm (inch)

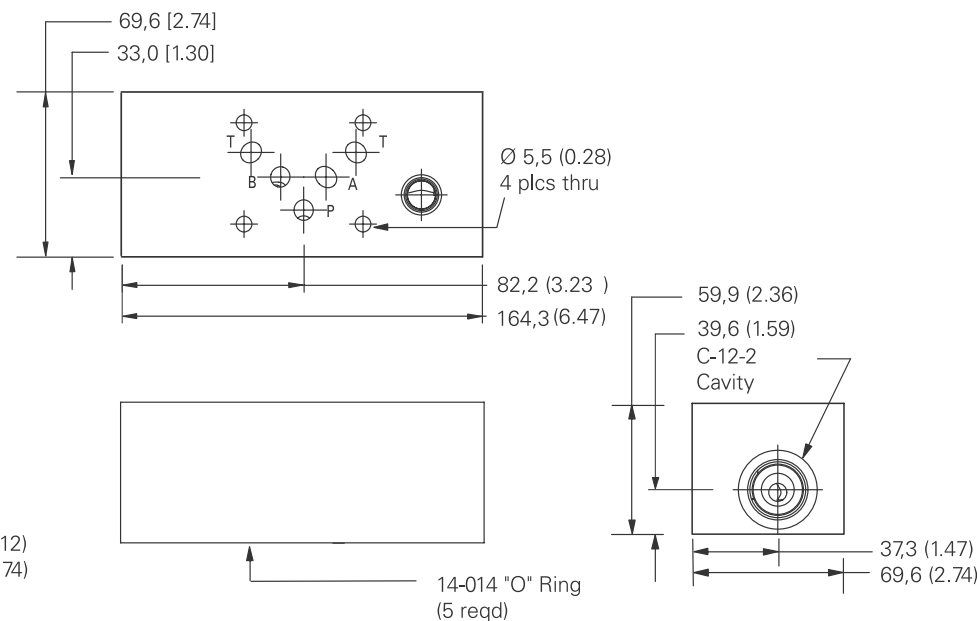
Cavity porting



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

A521W Housing kit

Part Number 6021158-0 01



Typical cartridges

Function

RV3-12

Cross port relief valve A& B

RV11-12

Cross port relief valve A& B

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

Dimensions

ISO 05/D05/NG Housing kits

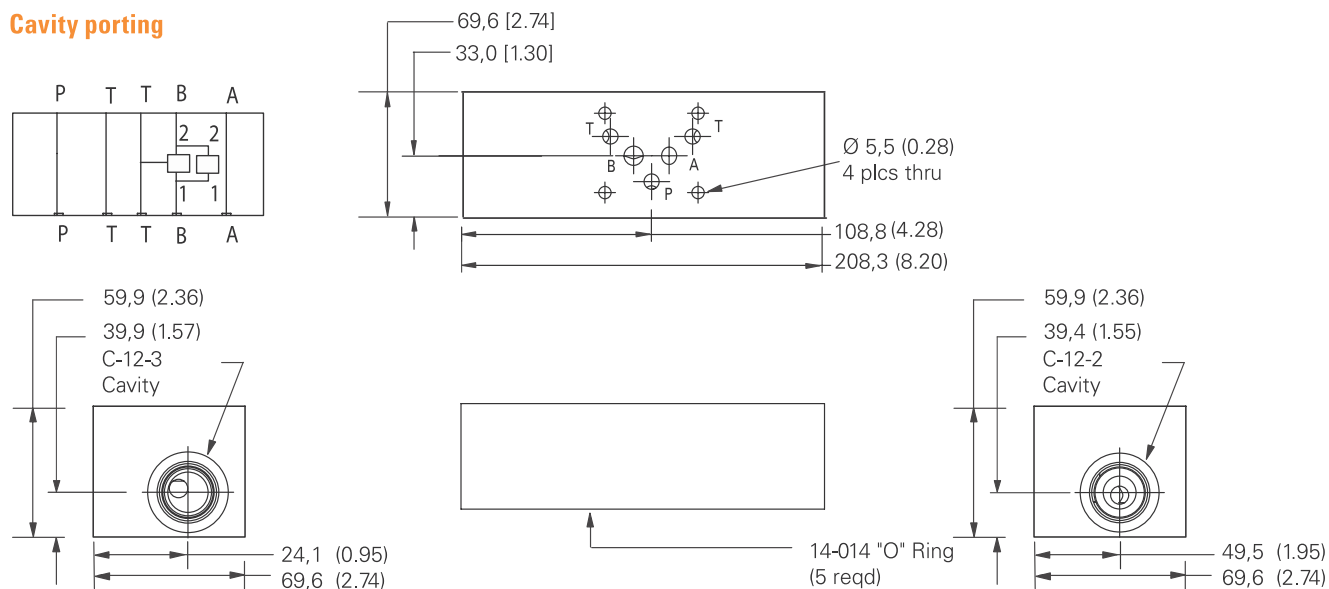
Dimensions

mm (inch)

A510B Housing kit

Part Number 6021352-0 01

Cavity porting



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

Typical cartridges

Function

PRV12-12/CV11-12	Reducing valve (B) drained to T, reverse free-flow check
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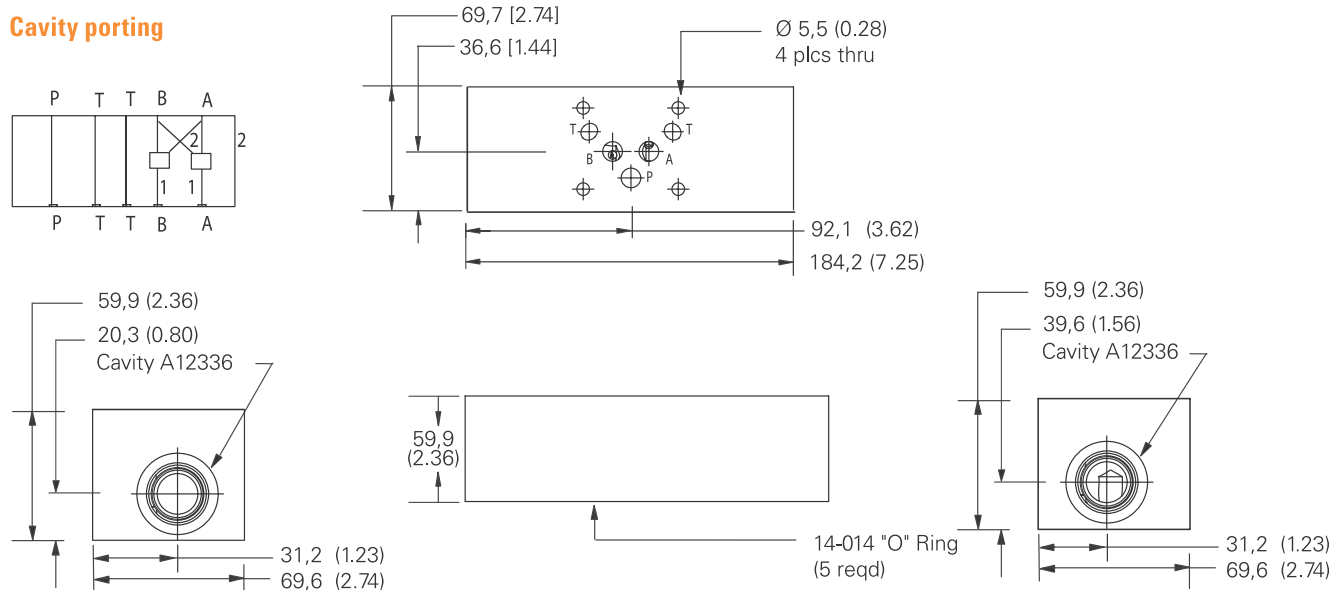
Dimensions

mm (inch)

A523W Housing kit

Part Number 5999906-0 01

Cavity porting



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

Typical cartridges

Function

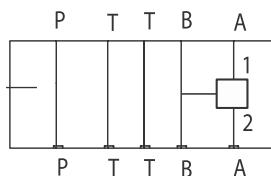
4CK90	Check in A and B Cross Piloted
1CE90	Overcenter in A and B Cross Piloted

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

Dimensions

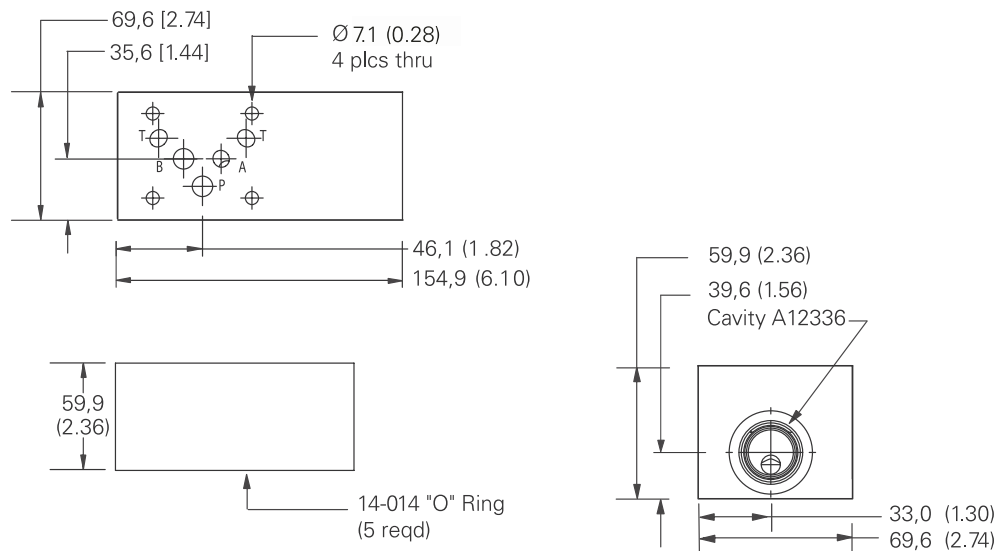
mm (inch)

Cavity porting



A523A Housing kit

Part Number 6021282-0 01



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

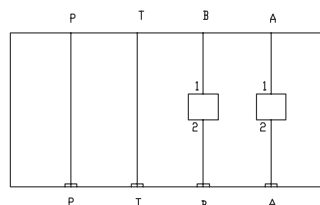
Typical cartridges

Function

4CK90	Check in A and Piloted from B
1CE90	Overcenter A and Piloted from B

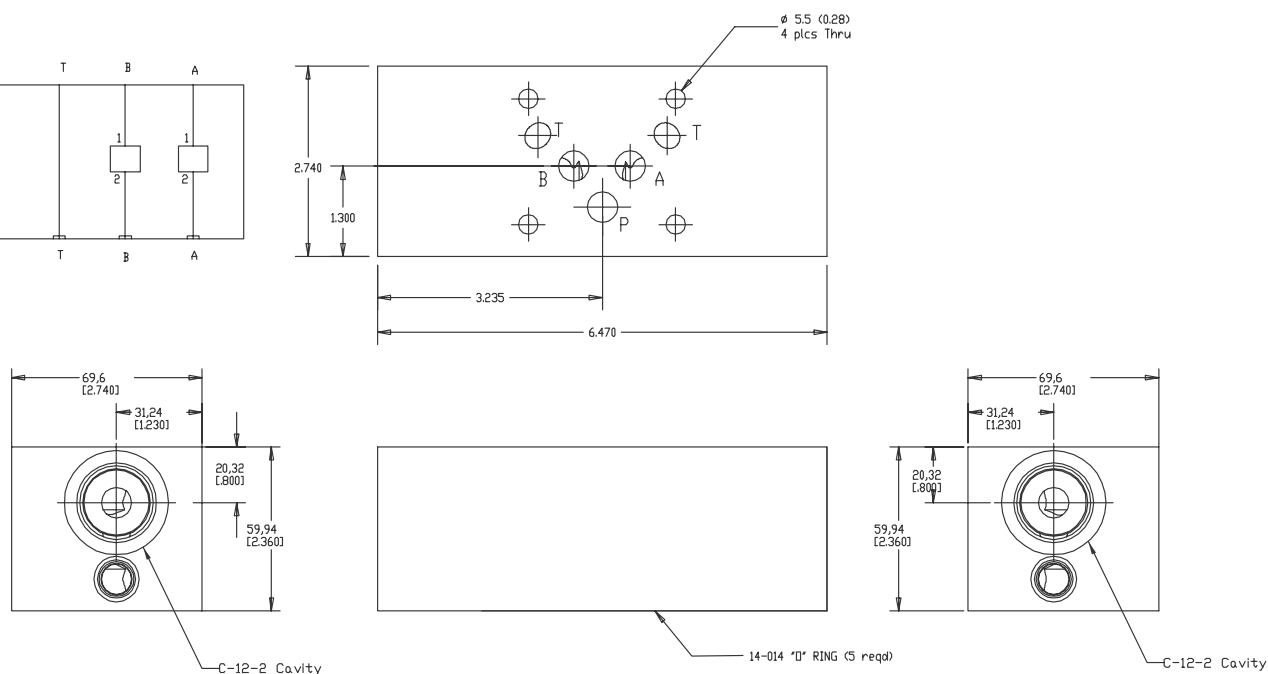
Dimensions

mm (inch)



A514W Housing kit

Part Number 4998388-001



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

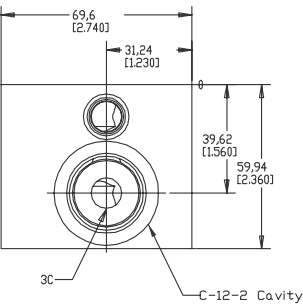
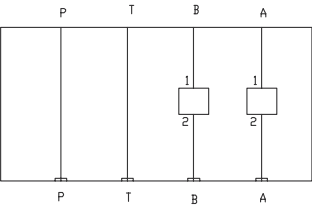
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Dimensions

ISO 05/D05/NG 10/CETOP5 Housing kits

Dimensions

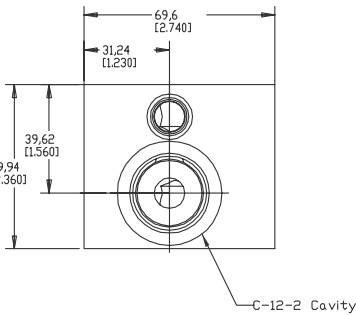
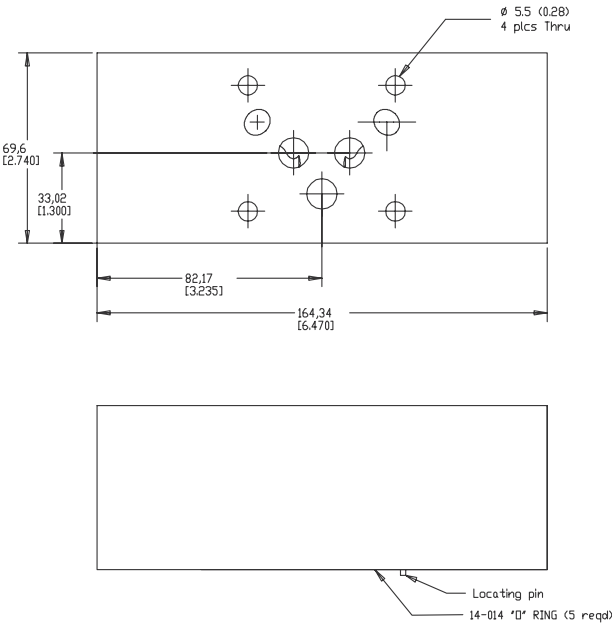
mm (inch)



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

A524W Housing kit

Part Number 4998389-001



Typical cartridges	Function
4CK90	PO Check Valve on A and Pilot from B
1CE90	Counterbalance Valve on A and Pilot from B

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

For enquiries please contact our
Technical Sales Team directly;
Tim Daniels: 0400 665 388

Alternatively contact us via
the office on **02 9938 5400**



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