



# DIRECTIONAL CONTROL VALVE SERIES CV 300



RELIABILITY FROM QUALITY



Page 3	General Information
Page 4	Technical data
Page 5	Dimensions
Page 6	Secondary Valves
Page 7	Cylinder port mounted secondary valves
Page 8	Spool - Control characteristics
Page 9-10	Spool Controls
Page 11-12	Order Code



**The CV 300** is a modular monoblock valve which is available in 1 to 4 and 6 sections, with the option of additional spool functions by using a High pressure carry-over fitting (Power Beyond). The valve is designed for a maximum working pressure of 320 bar (4600 psi) with a flow from 40 to 140 l/min (9-37 USGpm.).

**The CV 300** valve offers its user optimised characteristics with regard to function, capacity and quality. It is designed with the machine builders high demands of cost effectiveness, function and need of exceptionally good load maneuverability in mind. Suitable areas of use are forklift trucks, lorry mounted cranes, dumpers, loaders, excavators and other equipment where precise load control is required. Although the valves external dimensions are small, it does allow high internal flows and can be equipped with a large number of accessories as standard. The uniquely designed canal system results in exceptionally low pressure drops leading to improved performance and longer life not only of the control valve but also of the other components in the hydraulic system.

**The CV 300** is manufactured using the highest quality alloy cast iron which in combination with NIMCO's advanced machining and control methods assures the precise accuracy of every component. Each valve is tested and the results documented prior to despatch.

#### **Minimised spool leakage.**

Hard chromium plated spools, low friction and a specially developed honing method gives absolute minimum spool leakage of the valve.

#### **Easy assembly.**

The valve has two pressure inlets and two tank outlets allowing pipes and hoses to be connected either from the side or top of the valve.

#### **Excellent load control.**

CV 300 can be fitted with the standard load control spools or with specially designed spools for specific flows, each of which is designed to provide optimum control characteristics within its flow range. On request, special spools can be designed for special functions.

#### **Full utilisation of the spool stroke.**

The optimised soft maneuver grooves integrated in each spool and the precise machining of every component allows the entire stroke of the spool to be used. This allows full control of the load whether the operator is using very little or full flow capacity. In addition the movement of any spool in any direction will give the same speed of machine function, enhancing security and reliability.

#### **Multifunctional control.**

Several spools can be operated at the same time even when very large differences in load are at hand due to the utilisation of the differential pressure built up inside the valve during operation.

#### **Uniform and low lever forces.**

By combining the unique design features of the valve body and the spools, an excellent balance of the dynamic forces is achieved throughout the entire pressure and flow range. This keeps spring forces at a minimum and makes the valve very easy to operate by hand lever as well as when any of the NIMCO's remote control valves are used.

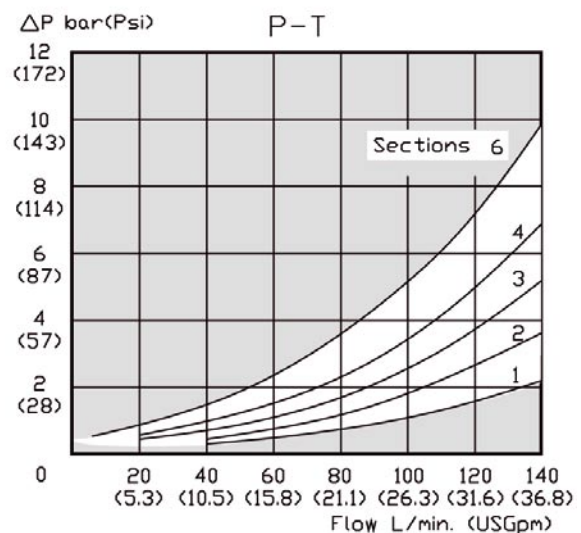
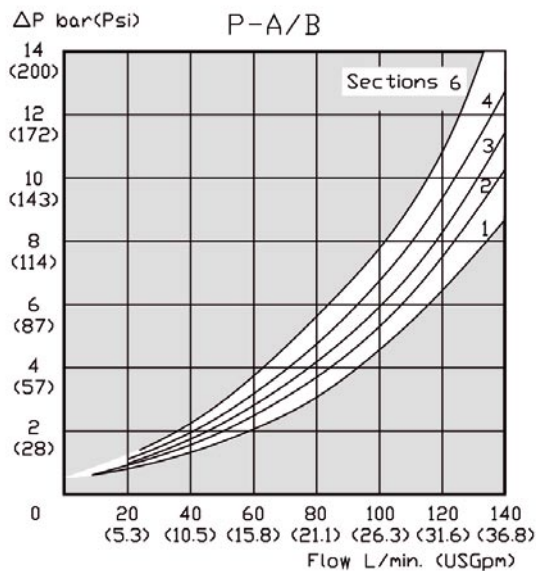
#### **Wide range of accessories.**

The CV 300 offers a wide range of possibilities by using existing and future accessory valves. Also a wide range of spool and remote controls such as single or joystick wire controls, pneumatic and hydraulic proportional or on/off controls are available.

<b>Max. pressure setting</b>	<b>bar</b>	<b>psi</b>
Main relief valve	320	4600
Port relief valve	300	4200
Tank line	10	150
<b>Flow rates</b>	<b>l/min</b>	<b>US GPM</b>
Maximum for the valve	140	37
<b>Temperature range</b>	<b>° C</b>	<b>° F</b>
Standard seals	-40 to +80	-40 to +176
<b>Spool leakage at</b>	<b>cm<sup>3</sup>/min</b>	<b>inch<sup>3</sup>/min</b>
100 bar (1450 psi) and 46 mm <sup>2</sup> /s (cSt) (117 SSU) viscosity A and B port	Max 10	Max. 0.6
<b>Filtration</b>		
Contamination level equal to or better than	18/14 according to ISO 4406	NAS 1638-class 10
<b>Viscosity</b>	<b>mm<sup>2</sup>/s</b>	<b>cSt</b>
Recommended operating viscosity range	10-400	47 - 1875
Start viscosity up to	1000	4687
<b>Weight</b>	<b>Kg</b>	<b>lbs</b>
CV 301	8.5	18.9
CV 302	11.7	26
CV 303	15.9	35.3
CV 304	19.8	44
CV 306	28.2	62.7

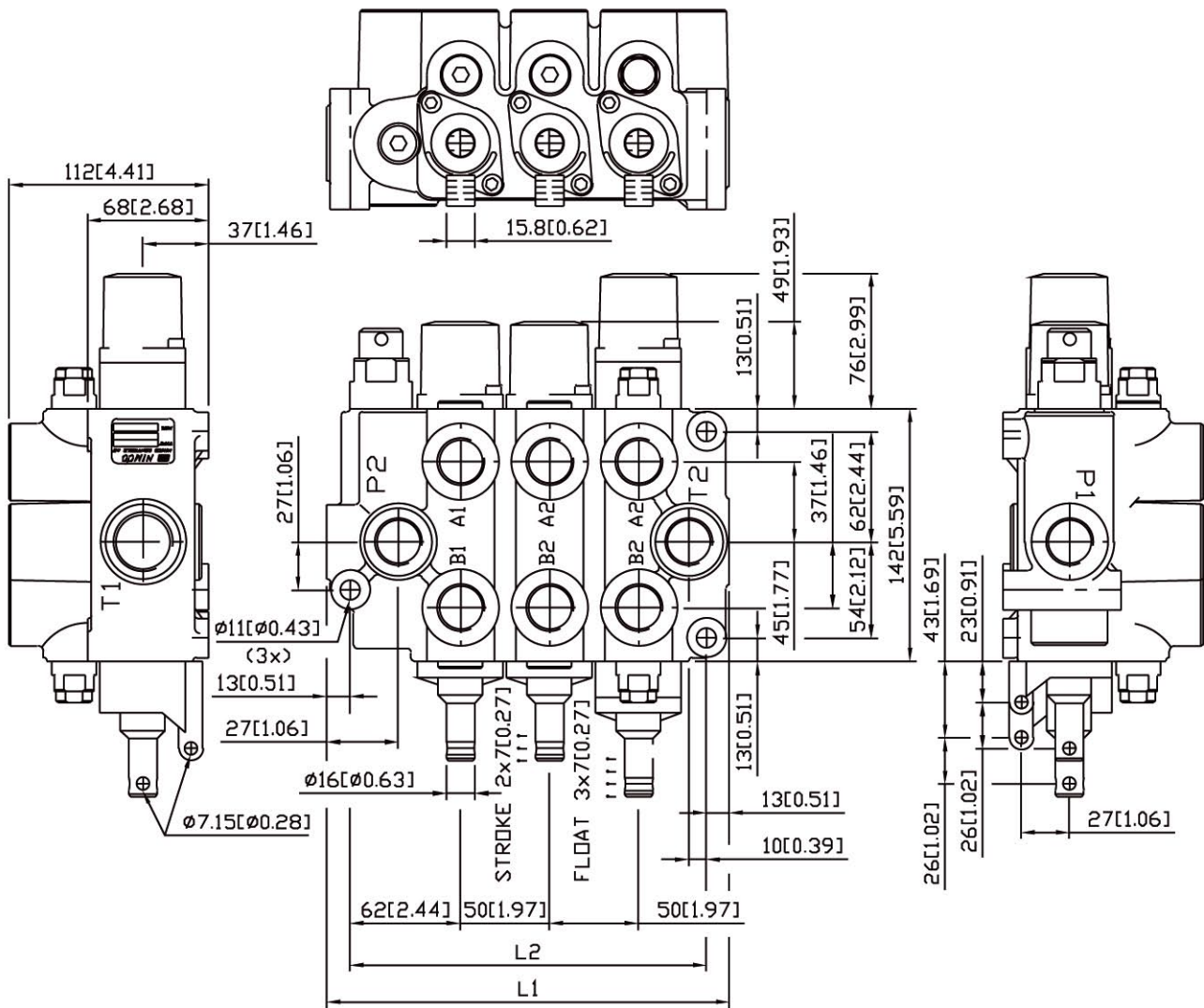
## Performance curves

Pressure drops at 25 mm<sup>2</sup>/s (cSt) (117 SSU) viscosity, 50°C (122°F) temperature and standard spool.



**DIMENSIONS**

EUROPEAN VIEW SETTING

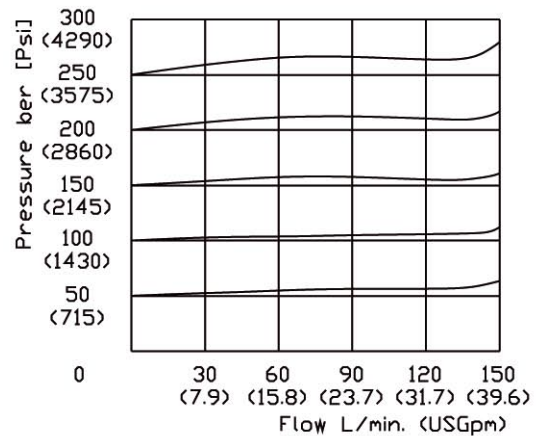
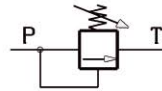
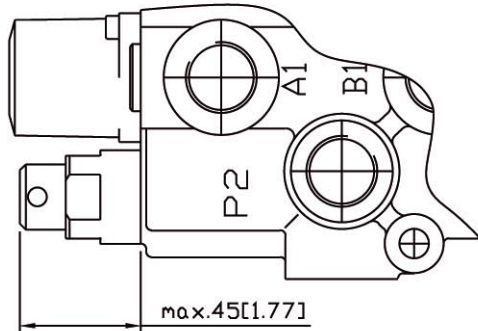


Dimensions	L1 mm (inch)	L2 mm (inch)
CV 301	126 (4.96)	100 (3.94)
CV 302	176 (6.93)	150 (5.91)
CV 303	226 (8.90)	200 (7.87)
CV 304	276 (10.87)	250 (9.84)
CV 306	376 (14.80)	350 (13.78)

Port Size	BSP	Metric	SAE
A, B	3/4"	M22 x 1.5	11/16-12 SAE12
P1, P2, T2	3/4"	M22 x 1.5	11/16-12 SAE12
T1	1"	M27 x 2	15/16-12 SAE16

**SECONDARY VALVES**

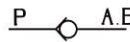
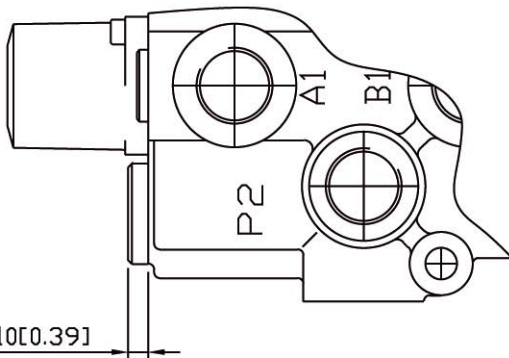
**Main relief valve.** Differential operated relief valve for the main circuit. Adjustable from 35 to 320 bar (500-4650 psi).



Part No. 4S-6020

**Order code: RV+pressure setting**

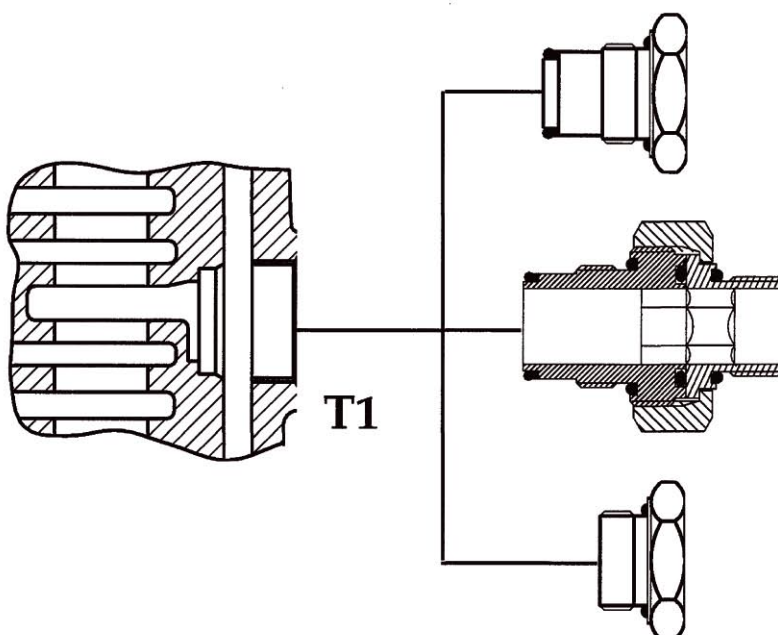
**Check valve.** Can be used when two or more valves are connected in series and operates with the same pressure. The first valve should then be equipped with a main relief valve RV and the subsequent valves with CV.



Graphs valid for 25 mm<sup>2</sup>/s (cSt.)  
 (117 SSU) 70 bar=1000 psi

Part No. 4S-6071

**Order code: CV**



**High pressure carry-over adaptors (Power Beyond)** are available to serial connect the CV 300 with one or more control valves, available from NIMCO.

Part No: 4S-1851 (BSP 1" → 3/4")

Part No: 4S-65251 (UNF 16 → 12)

Part No: 4S-1877 (BSP 1" → 3/4")

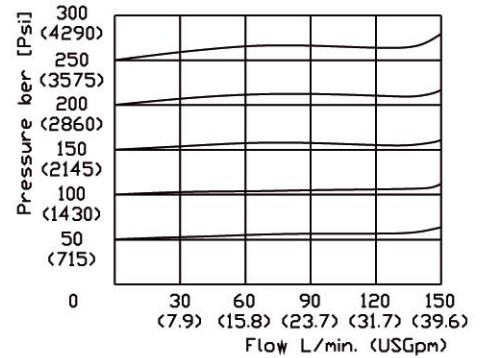
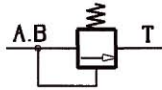
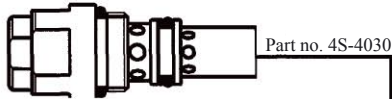
**Tank port reduction adaptor**, can be installed in the T1 port when the thread size is to be reduced.

Part No: 4S-1891 (BSP 1" → 3/4")

Part No: 4B-11599 (UNF 16 → 12)

**CYLINDER PORT MOUNTED SECONDARY VALVES**

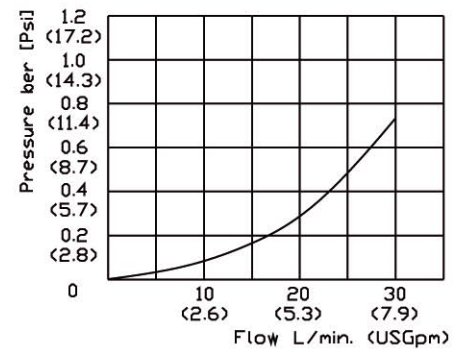
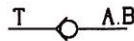
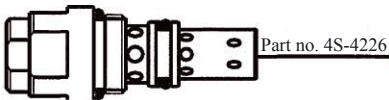
**Relief valve.** Differential operated port relief valve preventing pressure peaks. Fixed pressure setting from 35 to 320 bar (500-4650 psi).



Graphs valid for 25 mm<sup>2</sup>/s (cSt.)  
 (117 SSU) 70 bar=1000 psi

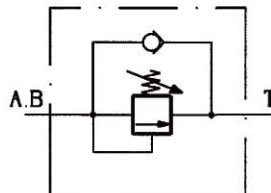
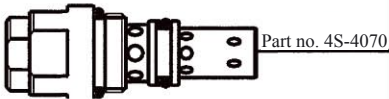
**Order code: C+pressure setting**

**Anti-cavitation valve.** Check valve used to level under pressures that can occur in the cylinder ports.



**Order code: A**

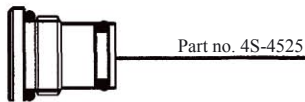
**Relief anti-cavitation valve.** Works as both port relief and anti-cavitation valve.



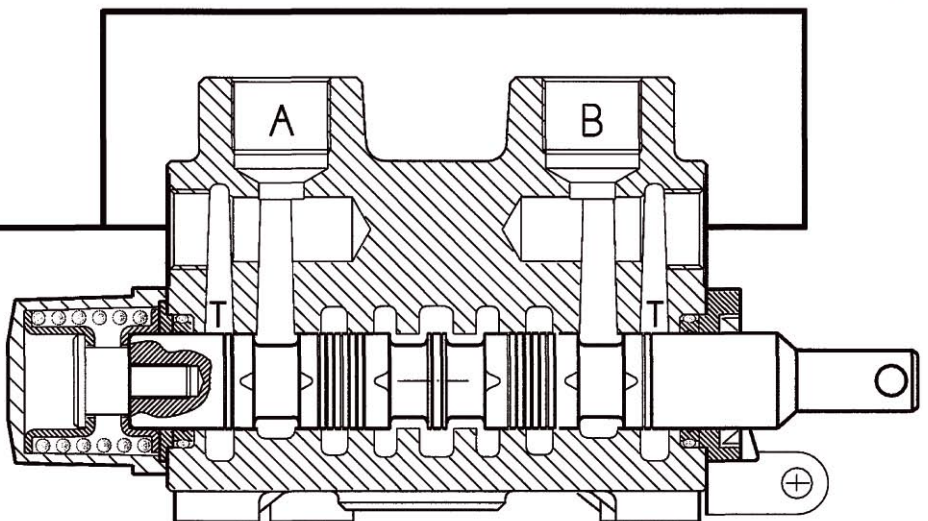
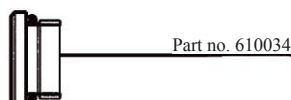
Characteristics according to C and A.

**Order code: CA+pressure setting**

**P1 Cylinder port accessory valve blank.**  
 The plug is used when a cylinder port accessory cavity should be blanked off.

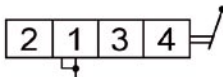
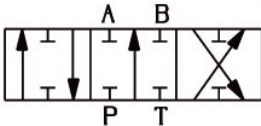
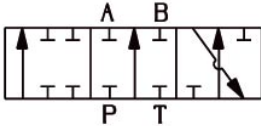
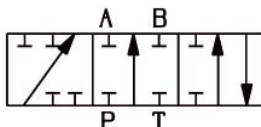
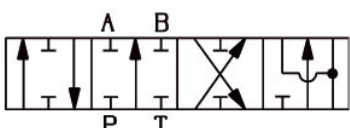
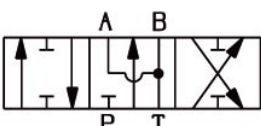


**P2 D/A to S/A conversion plug.**  
 This plug is used when a fitted double acting spool is to be used as a single acting function while maintaining oil in both the chambers of the cylinder.



## SPOOL - CONTROL CHARACTERISTICS

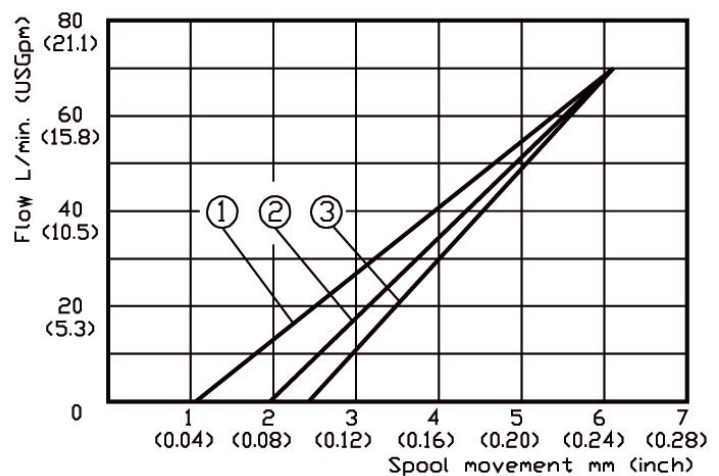
All of NIMCO's spools are designed for specific flow rates in order to achieve optimal load control characteristics and to fully utilise the spool's entire stroke. By optimising the balance between spools and valve housing, spring forces are minimized and exact maneuvering is achieved. Besides the standard spools listed there are also special spools available. For further information concerning these types please contact your NIMCO representative.

Spool type	Symbol 	Order code Standard spool	Part No.
Double acting		1S	3B-6035
Single acting A-port		2SA	3B-6028
Single acting B-port		2SB	3B-6026
Double acting with float position		3S	3B-6070
Motor		4S	3B-6049

### Control Characteristics P-A(B), Spool S.

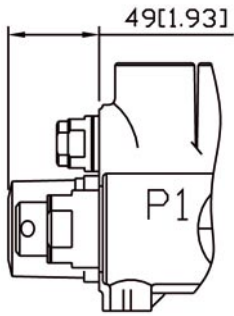
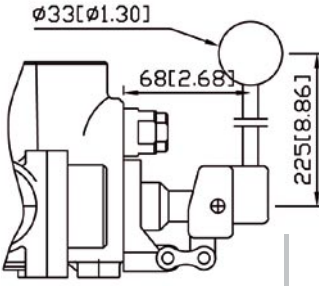
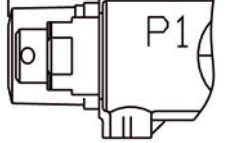
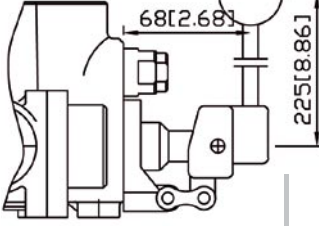
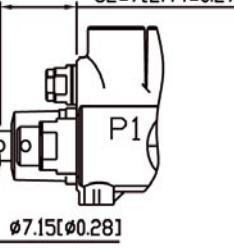
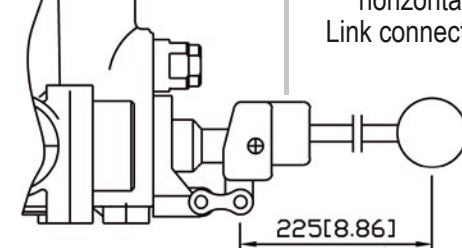
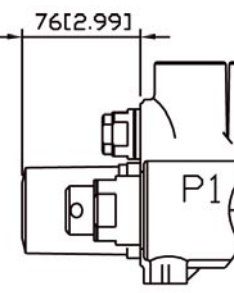
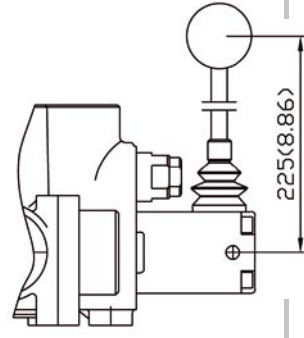
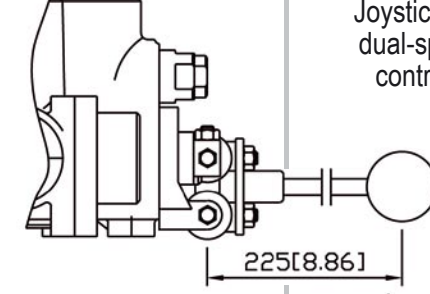
Pump flow 70 l/min (19 US Gpm).  
 Viscosity 25 mm<sup>2</sup>/s (cSt) (117 SSU)  
 Oil temp. 50° C (122° F).

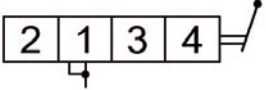
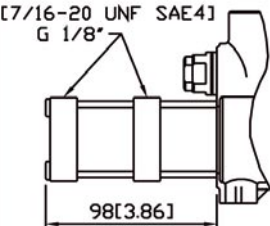
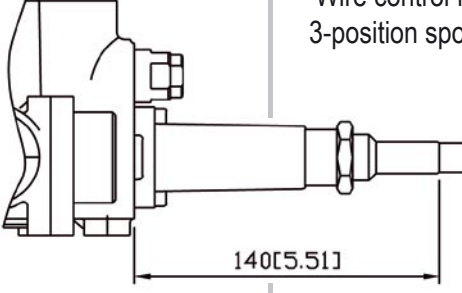
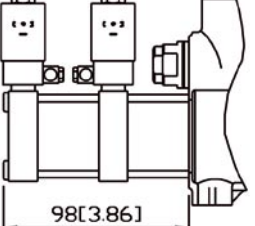
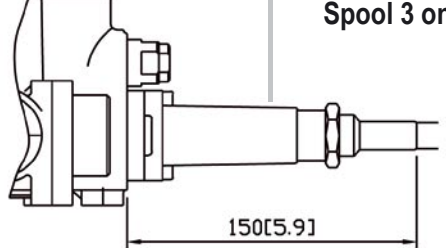
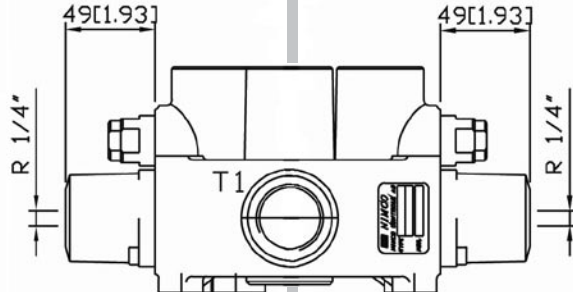
1. Pressure in work port 50 bar (725 psi)
2. Pressure in work port 150 bar (2175 psi)
3. Pressure in work port 250 bar (3625 psi)

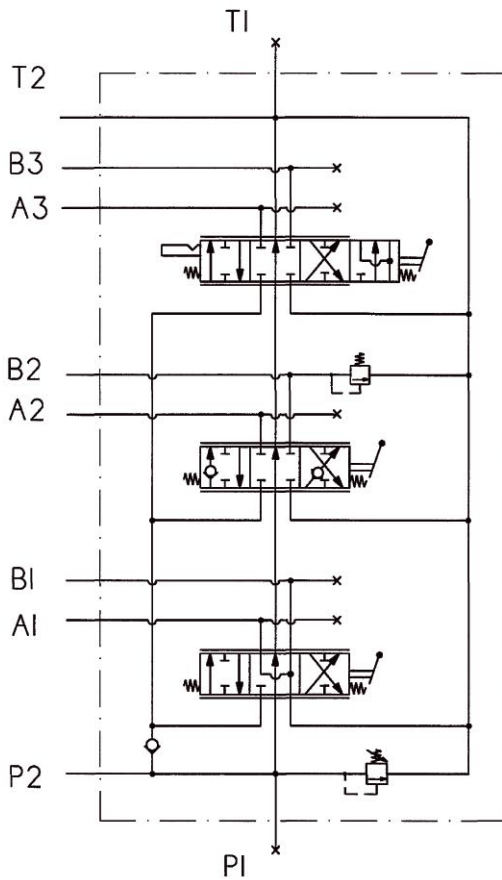




**SPOOL CONTROLS**

Code	Type	A-side	2 1 3 4 B-side	Type	Code		
9	Spring centered.	 <p>49[1.93]</p>	 <p>ø33[ø1.30] 68[2.683] 225[8.86]</p>	Hand lever vertical. Link connection.	S1		
9M	Marine version.			 <p>P1</p>		Hand lever vertical, opposite direction. Link connection. Other length and hand knobs upon request.	S7
10	Detent in position 1, 2 and 3						
10M	Marine version						
9S	Spring centered with straight through spool.	 <p>62±7[2.44±0.27]</p> <p>P1</p> <p>ø7.15[ø0.28]</p>	 <p>225[8.86]</p>	Hand lever horizontal. Link connection.	S2		
10S	Detent in position 1, 2, 3 and straight through spool.						
11	Spring centered. Detent in position 4. <b>Spool 3 only</b>	 <p>76[2.99]</p>	 <p>225[8.86]</p>	Hand lever vertical. Encased. Marine version, in combination with 9M and 10M only.	S5M		
12	Spring centered. Detent in pos. 3 and 4. <b>Spool 3 only.</b>						
13	Spring centered. Detent in position 2.						
14	Spring centered. Detent in position 3.						
15	Spring centered. Detent in pos. 2 and 4. <b>Spool 3 only.</b>						
			 <p>225[8.86]</p>	Joystick for dual-spool control.	S6		

Code	Type	A-side	 B-side	Type	Code
<b>P</b>	Pneumatic on/off.			Wire control for 3-position spool.	
<b>PP</b>	Pneumatic proportional.				<b>3W</b>
<b>H</b>	Hydraulic on/off. Pilot pressure 6-15 bar 87-217 psi.				
<b>HP</b>	Hydraulic proportional. Pilot pressure 6-15 bar 87-217 psi.			Wire control for 4-position spool. <b>Spool 3 only.</b>	
<b>EP</b>	Electro-pneumatic on/off. 12v/270mA alt. 24v/150mA. Hirschmann contact is standard. Others are available on request.				<b>4W</b>
<b>HD</b>	Hydraulic on/off. Pilot pressure 6-15 bar 87-217 psi.				<b>HD</b>
<b>HPD</b>	Hydraulic proportional. Pilot pressure 6-15 bar 87-217 psi.			HD and HPD cannot be combined with any other spool controls.	<b>HPD</b>



**EXAMPLE 1:**

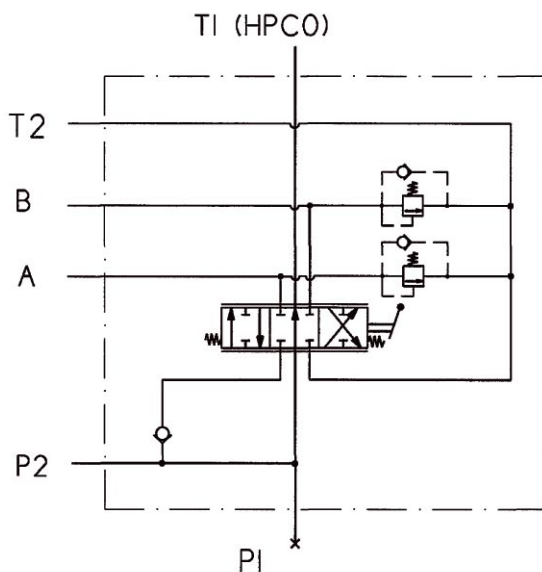
Spool 3 is double acting with float position (code 3), spring centered with detent for the float position (code 11) and equipped with a hand lever (code S1). Spool 2 is double acting with integrated load holding check valves (code 5), spring centred (code 9), and equipped with a cylinder port relief valve in port B (code C) and hand lever (code S1).

Spool 1 is a double acting motor spool (code 4), spring centred (code 9) and equipped with a hand lever (code S1).

The valve is fitted with a main relief valve (code RV), pressure port P2 and tankport T2 are left open for hose connection.

**Order code:**

**CV303-RV210-P2-1S9.S1xx-5S9.S1xC140-3S11.S1xx-x-T2-G**



**EXAMPLE 2:**

This valve has a double acting spool (code 1), which is spring centered (code 9), two cyl. port/anti-cavitation valves in both cyl. ports (code CA) and equipped with a hand lever (code S1).

The valve is not fitted with a main relief valve (code CV instead of RV), pressure port P2 and tank port T2 are left open for hose connection. A high pressure carryover adaptor is fitted in the T1 port.

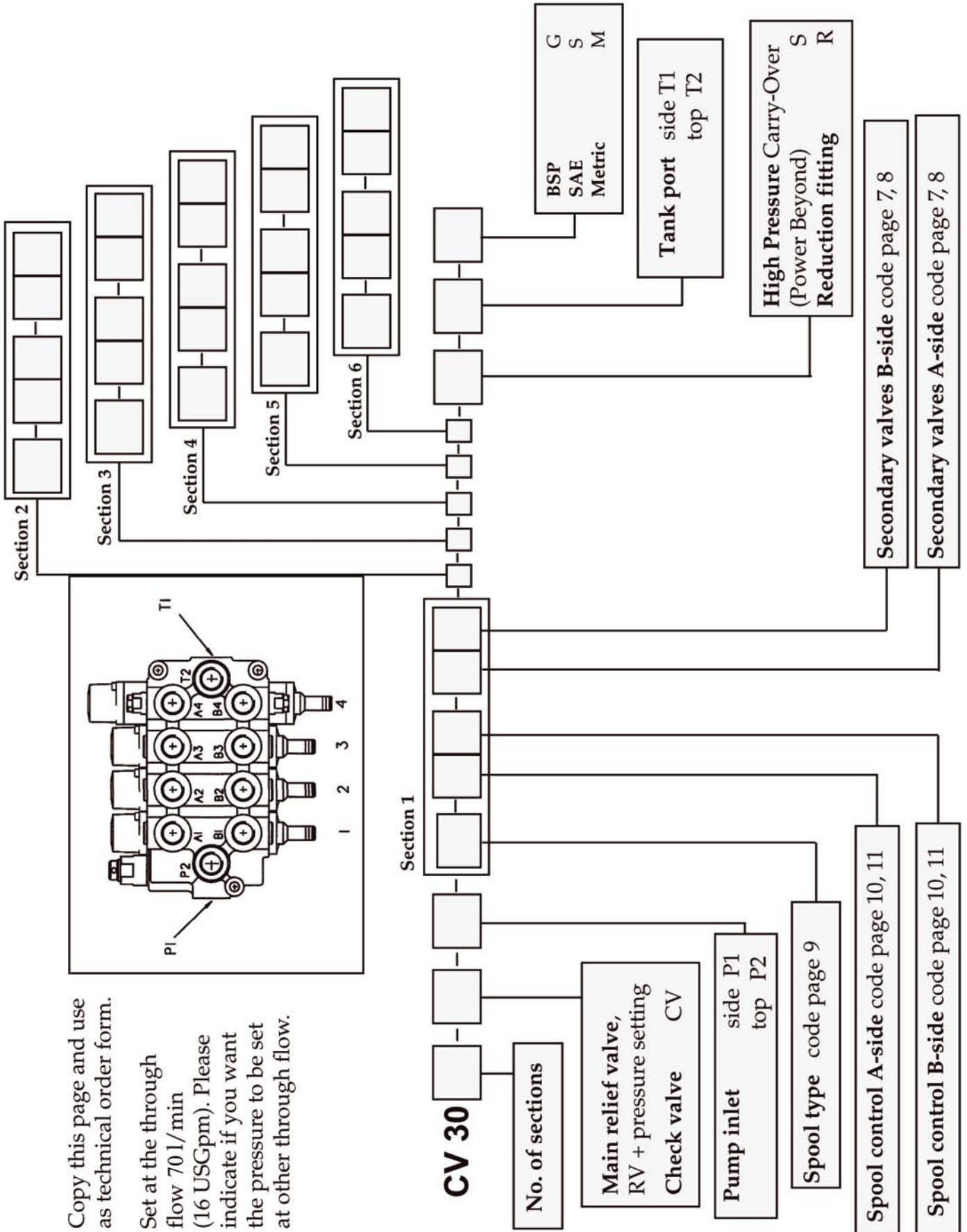
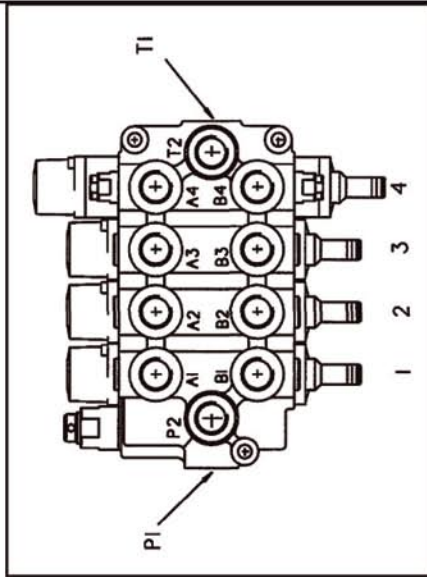
**Order code:**

**CV301-CV-P2-1S9.S1CA140CA95-S-T2-G**

**ORDER CODE**

Copy this page and use as technical order form.

Set at the through flow 70 l/min (16 USGpm). Please indicate if you want the pressure to be set at other through flow.



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# nimco

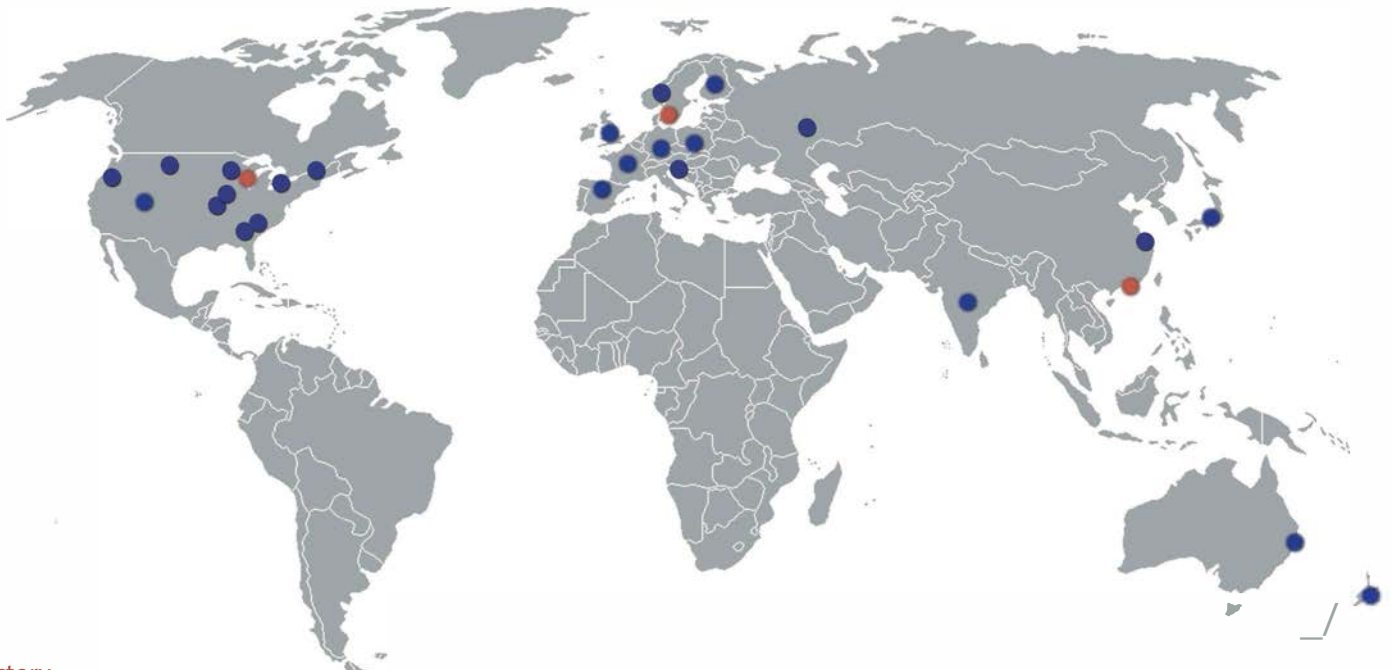
hydraulic systems

## Nimco Controls

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- Factory
- Distributor