Directional Control Valve
Series CV 400

nimco
hydraulic systems

The CV 400 Unibody is a modular monoblock valve which is available in 1 to 4 sections, with the option of additional spool functions by using a carry-over fitting (Power Beyond).The valve is designed for a maximum working pressure of 320 bar (4600 psi) with a flow from 15 to 80 l/min (4-21 USgpm).

The CV 400 Unibody valve offers its user optimized 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, cranes, loaders and other equipment where precise load control is required.
Although the valve's external dimensions are small, it will 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 400 Unibody 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 dispatch.

Unibody

The Unibody system is designed to give the valve user maximum flexibility and economy. The system comprises of a standard valve onto which a number of secondary valves can be mounted. Any combination of valves, already available in the program, and future developments in reponse to customer requests, can be mounted onto the valve in any preferred combination. Having all secondary valves directly on the valve, piping and hosing costs are kept to a minimum. Simultaneously, the user is allowed flexibility in designing the hydraulic system for each machine. The valve can be delivered with the Unibody functions already fitted to the valve or simply prepared for any of the large number of standard Unibody blocks that are available.

Minimized spool leakage.

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

Easy assembly.

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

Excellent load control.

CV 400 Unibody is delivered with a wide range of standard spools each of which is designed to provide optimum control characteristics within its flow range. On request, special spools can be delivered for other flow rates.

Full utilization of the spool stroke.

The optimized soft maneuver grooves integrated in each spool and the precise machining of every component allow for 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 utilization of the differential pressure built up inside the valve during operation.

Uniform and low lever forces.

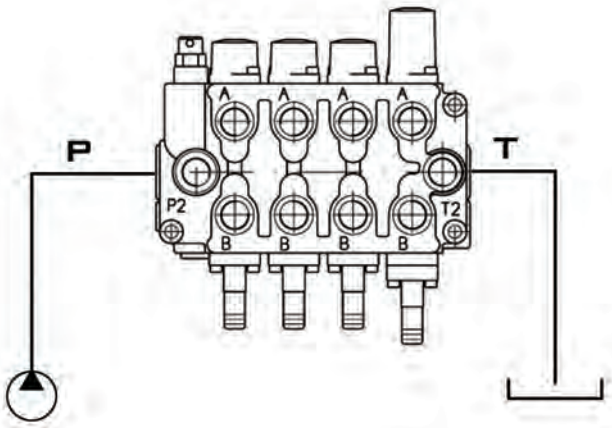
By combining the unique design features of the valve body and the spools, an excellent balance of the dynamic forces is achieved throughout the entire pressure and flow range. This keeps spring forces at a minimum and makes the valve very easy to operate by hand lever as well as when any of the NIMCO's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

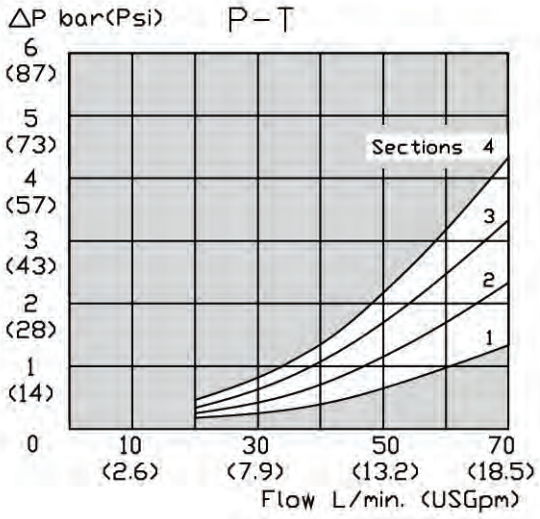
Wide range of accessories.

The CV 400 Unibody offers a wide range of options 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.

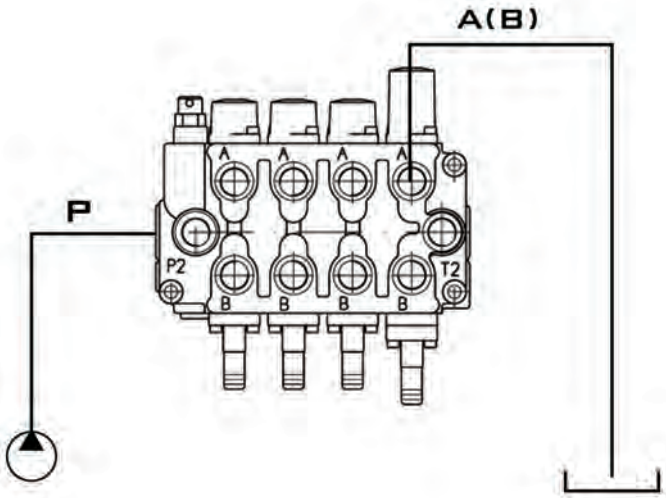
Max. pressure setting	bar	psi
Main relief valve	320	4650
Port relief valve	330	4700
Tank line	10	145
Flow rates	**l/min**	**USgpm**
Maximum for the valve	80	21
Temperature range	**°C**	**°F**
Standard seals	-40 to +80	-40 to +176
Spool leakage at	**cm^3/min**	**$inch^3$/min**
100 bar (1450 psi) and 25 mm^2/s (cSt) (117 SSU) viscosity A and B port	4	0.24
Filtration		
Contamination level equal to or better then	18/14 according to ISO 4406	NAS 1638-class 10
Viscosity	**mm^2/s(cSt)**	**SSU**
Recommended operating viscosity range	10-400	47-1875
Start viscosity up to	1000	4687
Weight	**kg**	**lbs**
CV 401	4.4	9.7
CV 402	6.6	14.5
CV 403	8.7	19.2
CV 404	10.9	24
Weight/Unibody option		
Single	0.3	0.7
Double	0.75	1.6
Operating force necassary to move the spool	**N**	**lbf**
Spring centered	130	29
Detent in	230	52
Detent out	200	45

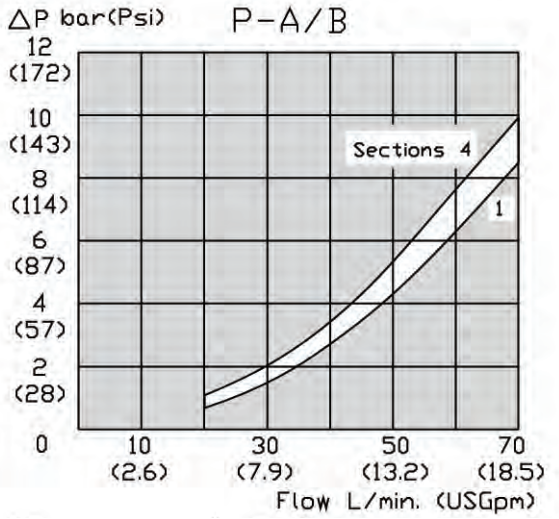
PRESSURE DROP P→T



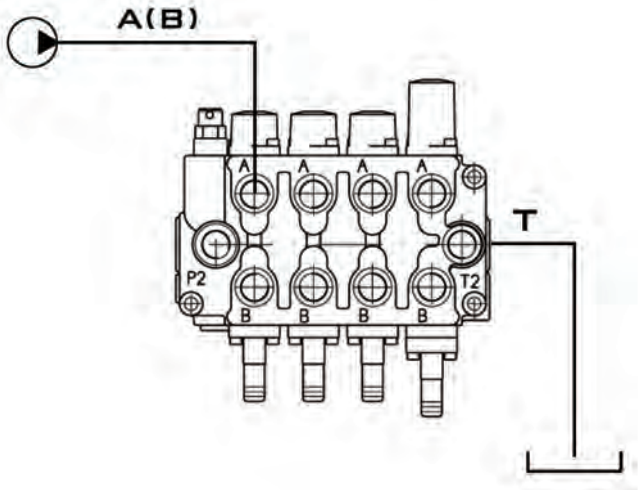


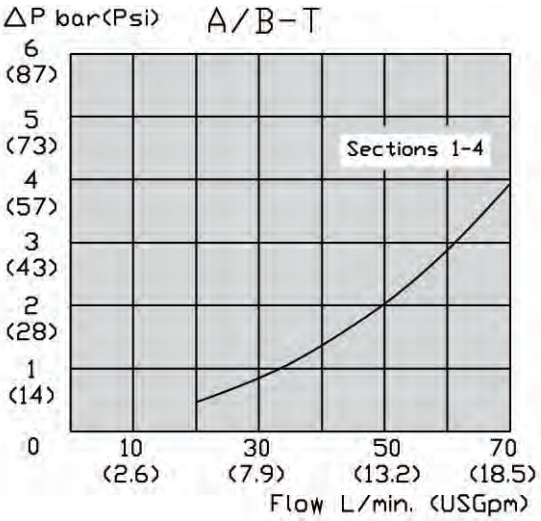
PRESSURE DROP P→A(B)

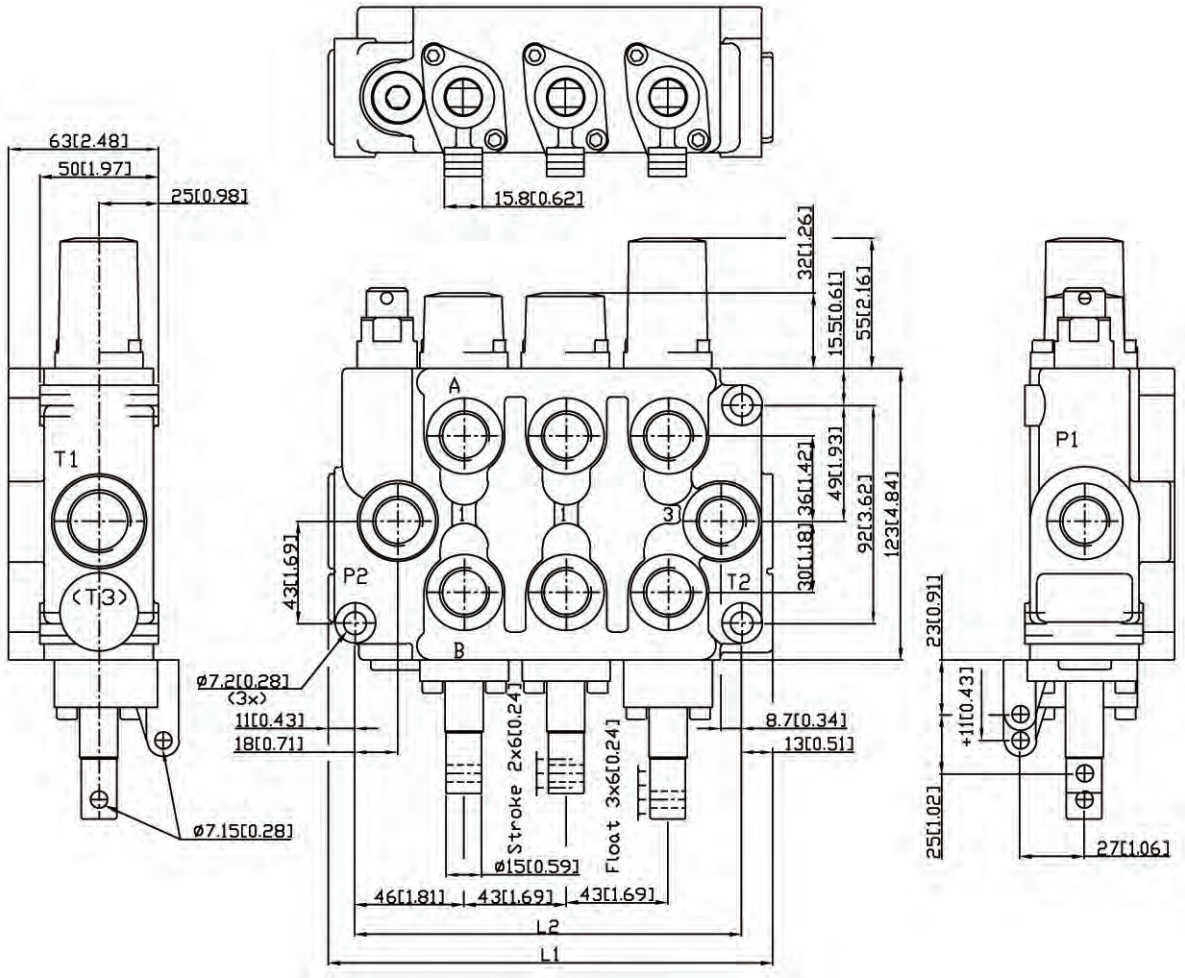




PRESSURE DROP A(B)→T

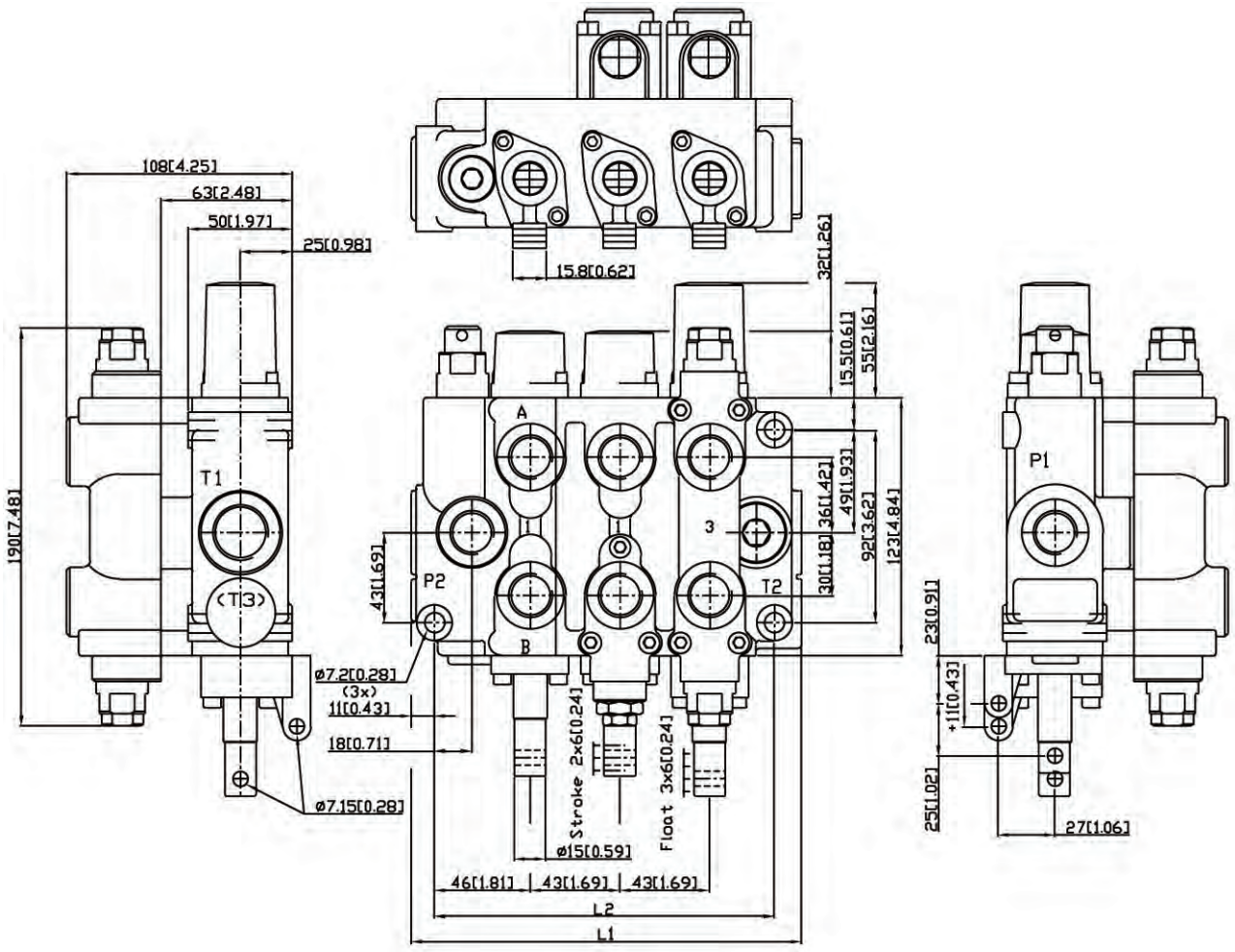






Dimensions	L1 mm (inch)	L2 mm (inch)
CV 401	101 (3.98)	77 (3.03)
CV 402	144 (5.67)	120 (4.72)
CV 403	187 (7.36)	163 (6.42)
CV 404	230 (9.06)	206 (8.11)

Port size	BSP	Metric	SAE
A,B	1/2”	M 18 x 1.5	3/4-16 SAE8
P1, P2, T2, (T3)	1/2”	M 18 x 1.5	3/4-16 SAE8
T1	3/4”	M 22 x 1.5	1 1/16-12 SAE12



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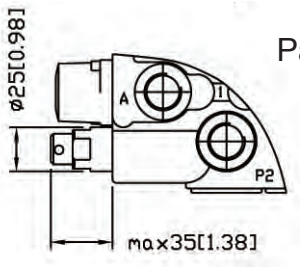
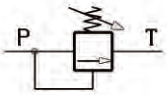
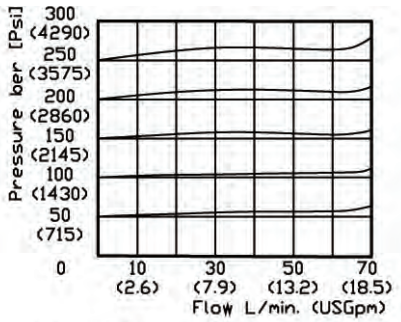
T1	3/4”	M 22 x 1.5	1 1/16-12 SAE12

Main relief valve. Differential operated relief valve for the main circuit. Adjustable from 35 to 320 bar (500-4600 psi).



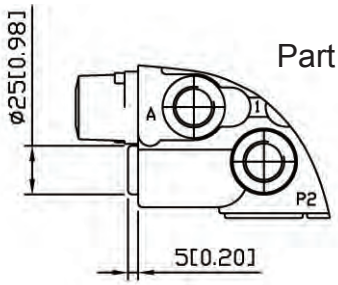
Part No: 4S-4076



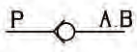


Order code: RV+pressure setting

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



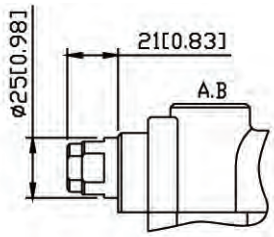
Part No: 4S-4094



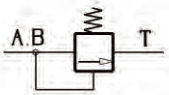
Graphs valid for
25 mm2/s (cSt.)
(117 SSU).
70 bar = 1000 psi

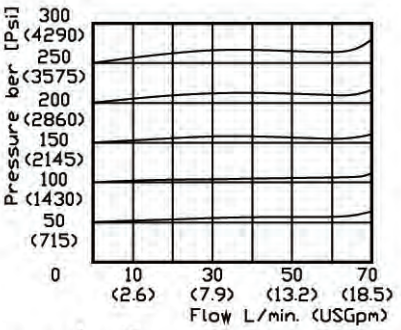
Order code: CV

Cylinder port mounted secondary valves.
Relief valve. Differential operated port relief valve preventing pressure peaks. Fixed pressure setting from 35 to 330 bar (500-4700 psi).



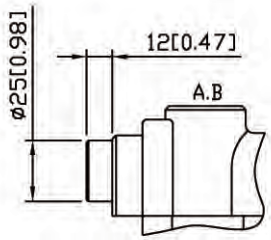
Part No: 4S-4030



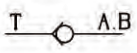


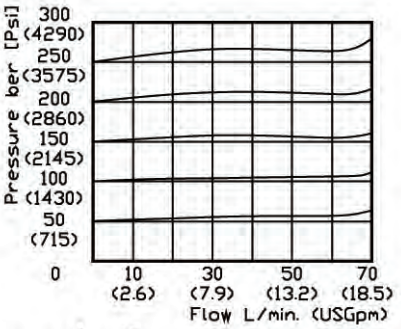
Order code: C+pressure setting

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



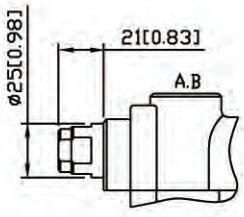
Part No: 4S-4226



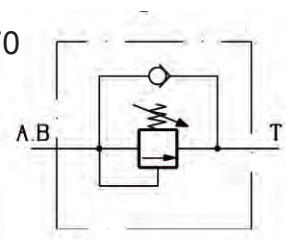


Order code: A

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



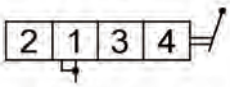
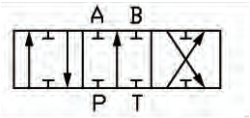
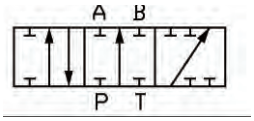
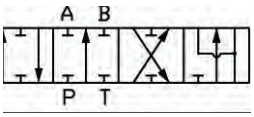
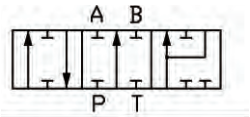
Part No: 4S-4070

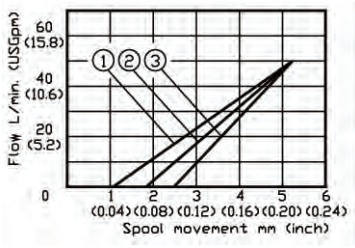
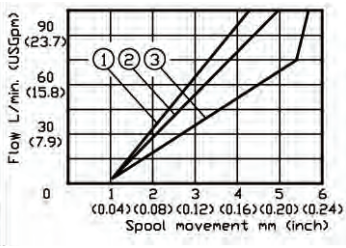


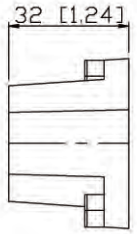
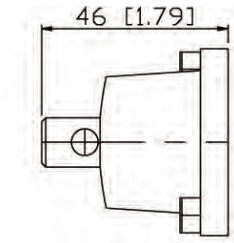
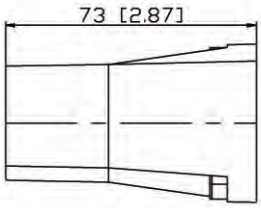
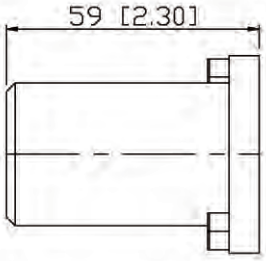
Characteristics according to C and A.

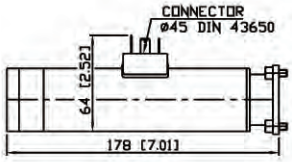
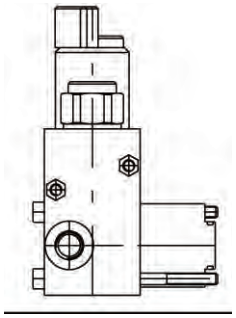
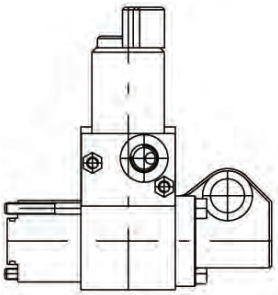
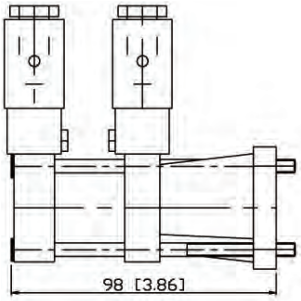
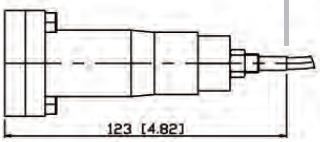
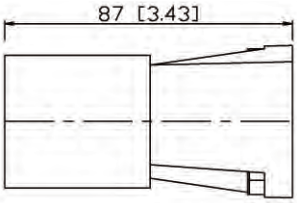
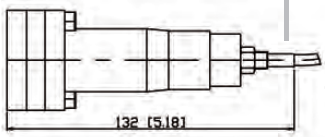
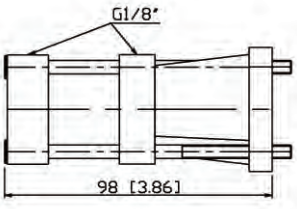
Order code: CA+pressure setting

All of NIMCO's spools are designed for specific flow rates in order to achieve optimal control characteristics and to fully utilize the spool's entire stroke. By optimizing the balance between spools and valve housing, spring forces are minimized and exact maneuvering is achieved. In addition to our standard spools are there a wide range of specially designed spools to maximize load control at different pump flows and applications. Please contact our factory or any authorized distributor for further information.

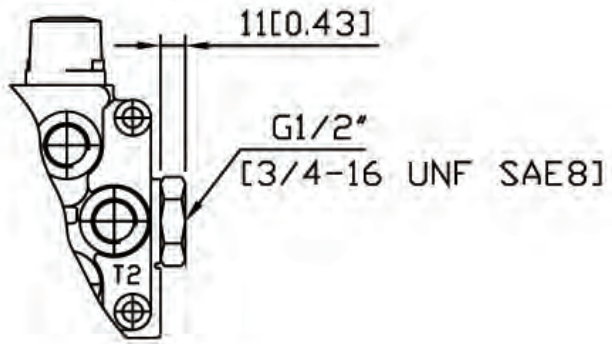
Spool type	Symbol	Order code Standard spool	Part No.
			
Double acting		1S	3B-4002
Single acting		2SA	3B-4004
Single acting B		2SB	3B-4122
Double acting with float position		3S	3B-4061
Motor		4S	3B-4035
Double acting with built in check valves		5S	4S-40087
Regenerative		6S	3B-40068

Control characteristics	P-A/B 1.Press. 50 bar (725 psi) 2.Press. 150 bar (2175 psi) 3.Press. 250 bar (3625 psi)	A/B-T Viscosity 25 mm²/s (cSt) 50
Standard spool Pump flow 50 l/min (13.2 USgpm).		

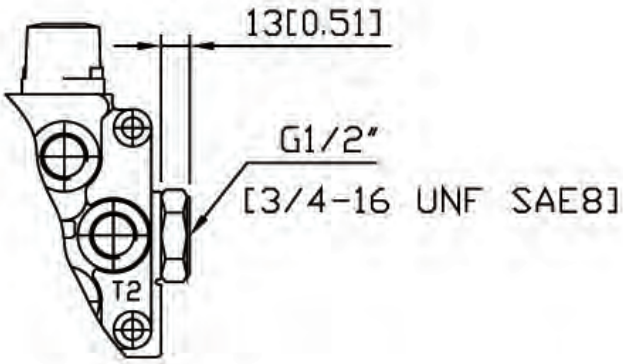
Code	Type	A-side 2 1 3 4 B-side	Type	Code
9 9M	Spring centered. Marine version.		Hand lever vertical. Other lengths on request.	S1
10 10M	Detent in position 1, 2 and 3 Marine version		Hand lever horizontal.	S2
10S	Detent in pos. 1, 2, 3 and straight through spool.		**Standard Control** Hand lever vertical. Encased.	S5
11	Spring centered. Detent in pos. 4.			
12	Spring centered. Detent in pos. 3 and 4.		Hand lever vertical. Encased. Marine version.	S5M
13	Spring centered. Detent in pos. 2.			
14	Spring centered. Detent in pos. 3.			
15	Spring centered. Detent in pos. 2 and 4.		Joystick for dual-spool control.	S6
16	Spring centered. Detent in pos. 1, 2, 3 and 4.			

Code	Type	A-side 2 1 3 4 B-side	Type	Code
EDA	Electric direct acting solenoid on - off. 12 V / 3.6 A 24 V / 1.8 A		Electro-hydraulic proportional. 12V/1.5 A 24V/0.75 A with manual hand lever override	EHP
EHP	Electro-hydraulic proportional. 12V/1.5 A 24V/0.75 A			
EP	Electropneumatic on-off. 12V/270mA alt. 24V/150mA.			Wire control for 3-position spool.
EK	External kickout. From pos. 3 to pos. 1.			Wire control for 4-position spool.
H	Hydraulic on/off. Pilot pressure 6-15 bar (87-217 psi)			
HP	Hydraulic proportional. Pilot pressure 6-15 bar (87-217 psi)			
P	Pneumatic on/off.			
PP	Pneumatic proportional.			

High pressure carry-over adaptor (Power Beyond), should be installed in the T1-port when two or more valves are used in the same circuit. T2 must then be connected to tank.

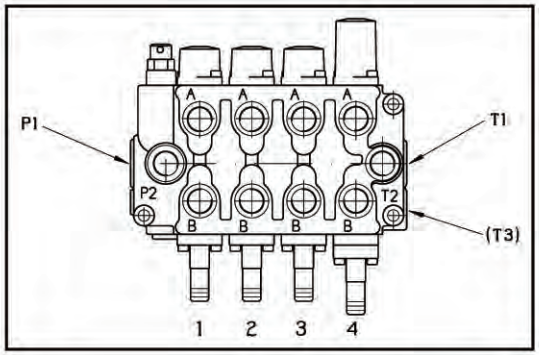


Tank port reduction adaptor, can be installed in the T1 port when the thread size is to be reduced from BSP 3/4" to BSP 1/2" or from SAE12 to SAE 8.



Copy this page and use as technical order form.

Set at the through flow 50 l/min (16 USGpm). Please indicate if you want the pressure to be set at other through flow.



CV 40

Section 1

Section 2

Section 3

Section 4

No. of sections

Main relief valve,
RV + pressure setting

Check valve CV

Pump inlet side P1
top P2

Spool type code page 9

Spool control A-side code page 10, 11

Spool control B-side code page 10, 11

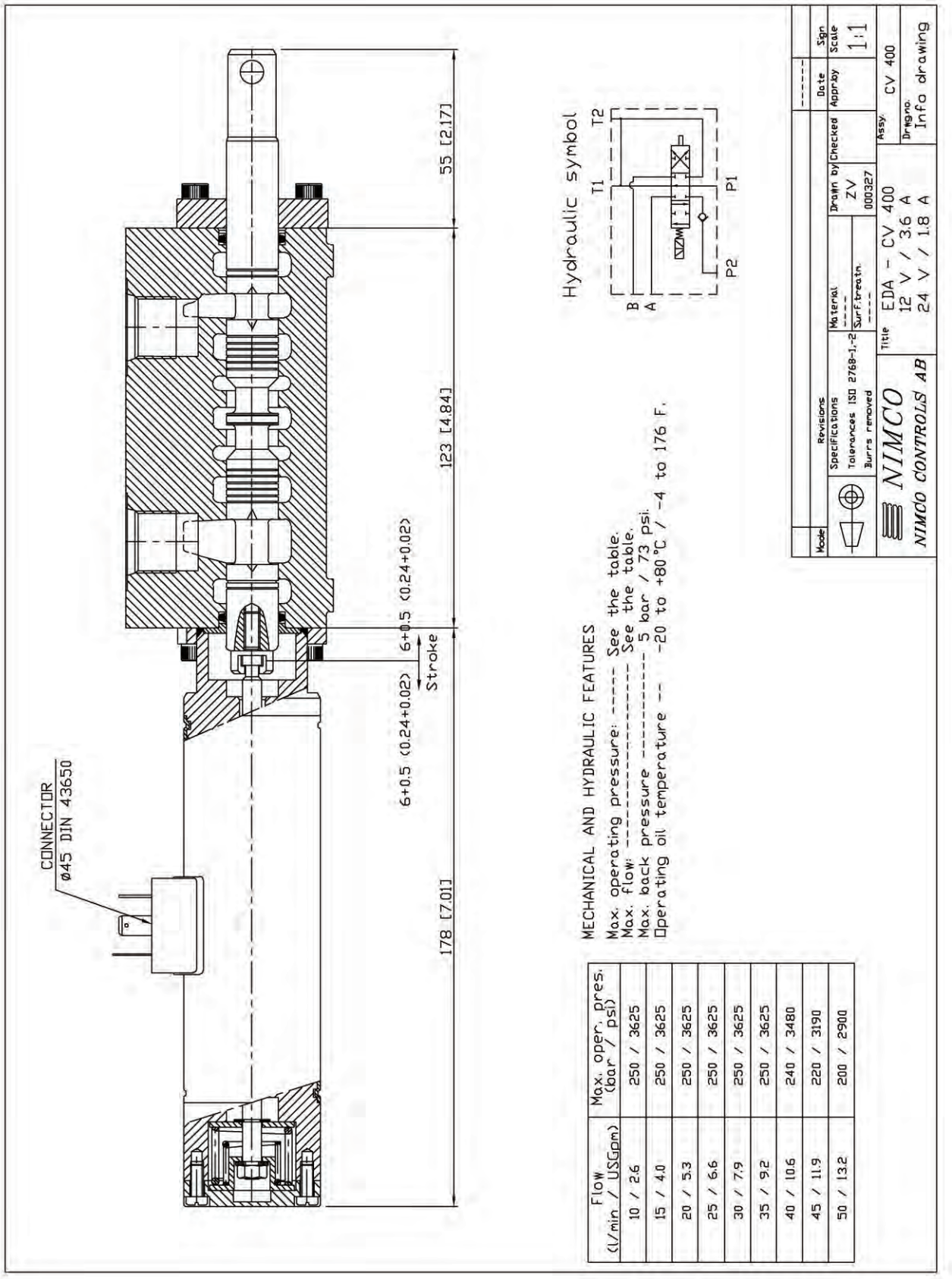
BSP G
SAE S
Metric M

Tank port side T1
top T2
side (T3)

High Pressure Carry-over
(Power Beyond) S
Reduction fitting R

Secondary valves A-side code page 8

Secondary valves B-side code page 8



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