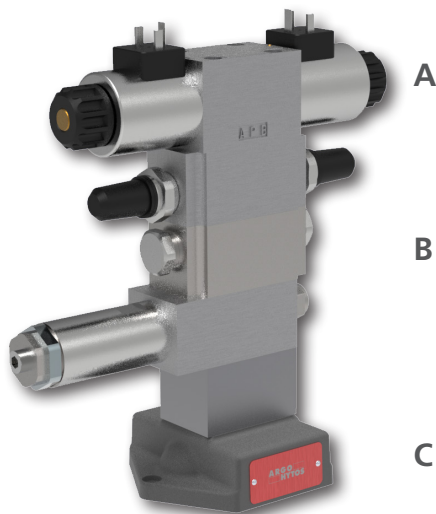
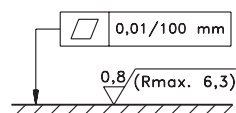
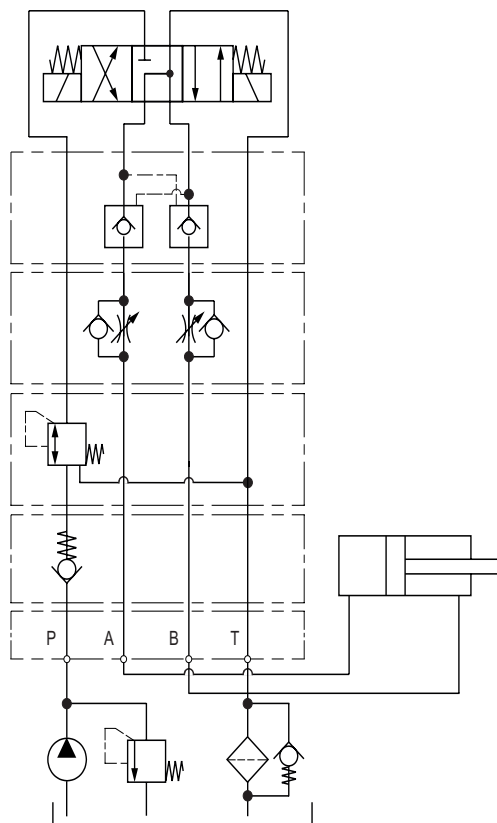


Modular Blocks Size 06 (CETOP 03) with Built-in Valves

Vertically integrated valves according to diagram



Example of a vertically integrated valves size 06



Required surface quality of the counterpart

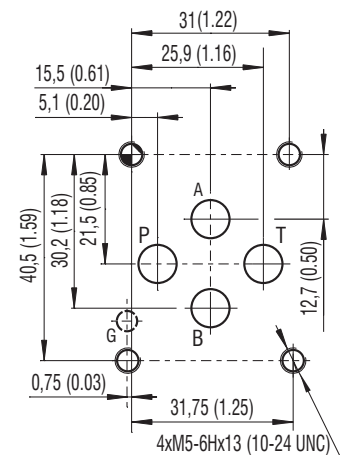
Technical Features

- › Simple creation of complicated hydraulic circuits
- › Flexible connection solution
- › Wide range of valves available
- › Circuit creation without the use of pipes and hoses
- › Saves build-in space

Functional Description

Vertically integrated modular blocks with built-in valves are assembled into a single unit using four M5 or 10-24 UNC threaded bolts and mounted to a base, e.g. to a subplate, a parallel circuit manifold with side ports or another block. The connection plate diagram conforms with ISO 4401. The surface of upper block is usually closed with connected directional control valve with body or with a blanking plate.

Connection diagram size 06 according to ISO 4401



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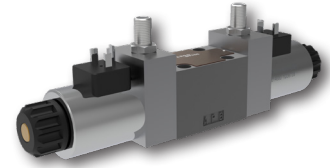
A. Valves with Body on the Upper Surface (CETOP Valves)

Directional Control Valves with Body

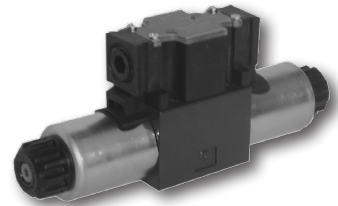
The valves control the movement direction of the actuator and usually close the upper surface of vertically integrated modular valves. The most commonly used are solenoid operated with one solenoid (4/2) or two solenoids (4/3, 4/2 with detent assembly of spool). However, they can also be operated manually, hydraulically or pneumatically.

Product name	Datasheet no.	Max. pressure [bar (PSI)] P,A,B / T	Max. flow [l/min (GPM)]	Description
RPE3-06	HA 4010	350 / 210 (5080 / 3050)	80 (21.1)	Solenoid operated directional control valve
RPEW4-06	HA 4035	350 / 210 (5080 / 3050)	80 (21.1)	Solenoid operated directional control valve with wire box
RPEL1-06	HA 4056	250 / 100 (3630 / 1450)	50 (13.2)	Solenoid operated directional control valve, lightline
RPR3-06	HA 4004	350 / 100 (5080 / 1450)	80 (21.1)	Manually operated directional control valve (with locked spool position or proportional control)
RPH2-06	HA 4005	350 / 130 (5080 / 1890)	80 (21.1)	Hydraulically operated directional control valve with control pressure of 30 to 160 bar
RPH3-06	HA 4006	350 / 160 (5080 / 2320)	80 (21.1)	Hydraulically / pneumatically operated directional control valve with control pressure of 2 to 25 bar

RPE3-063



RPEW4-06

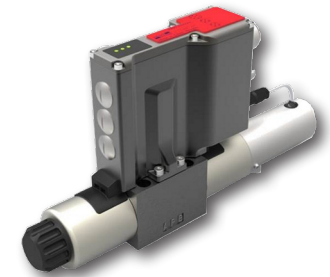


Proportional Directional Control Valves with Body

The valves can be used instead of standard valves. In addition to controlling the fluid flow direction, they enable smooth control of volumetric flow, and thus the moving speed of piston rod or hydraulic motor. To ensure the repeatability of regulation, it is necessary to stabilize the pressure drop on the control edges of spool using a two-way or a three-way pressure compensator. An electronic control unit is necessary for the valve control. It can be integrated on the top surface of the valve (on-board ECU) or located on an external standardised plate. Proportional valves allow comfortable, continuous remote control via electric command signal. The built-in spool position sensor as a feedback reduces the valve hysteresis to 0.5 %.

Product name	Datasheet no.	Max. pressure [bar (PSI)] P,A,B / T	Max. flow [l/min (GPM)]	Description
PRM2-06	HA 5104	350 / 210 (5080 / 3050)	40 (11)	Proportional directional control valve without feedback
PRM7-06	HA 5119	350 / 210 (5080 / 3050)	40 (11)	Proportional directional control valve with spool position & system feedback
PRM8-06	HA 5178	350 / 210 (5080 / 3050)	140 (37)	Proportional directional control valve without feedback - pilot operated
PRM9-06	HA 5129	350 / 210 (5080 / 3050)	30 (7.9)	Proportional directional control valve with spool position & system feedback and possible connection to CAN-bus line

PRM9-06

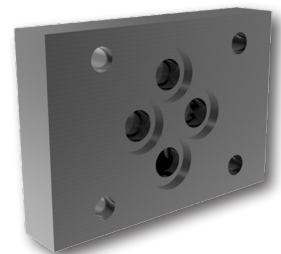


Blanking Plates

They can be used for closing the channels on the top surface of vertical integrated modular valves instead of a top valve with body. The plates enable various channels connection.

Product name	Datasheet no.	Material / max. pressure [bar (PSI)]	Description
DK1-06	HA 0003	Grey cast Iron / 320 (4640)	Blanking plate

DK1-06



Caution:

Modular blocks made of gray cast iron may be used up to pressure of 350 bar (5080 PSI). For higher system pressure up to 420 bar (6090 PSI), it is necessary to use modular blocks made of steel.



Caution:

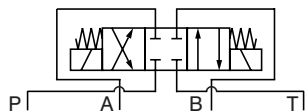
The valve pressure drop (Δp_v), given for specific flow volume in the valve datasheet, is increased by the pressure loss of the modular block (Δp_b) after assembly. The amount depends of the way of internal connection.

$$\Delta p = \Delta p_v + \Delta p_b$$

B. Valves Built-in Modular Blocks

Directional Control Valves, Spool Type

2/2 directional control valves, built in modular block, are often used as stop valves, connecting or unloading valves.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no. * Block height mm(in)
Stop valve in P channel		SD2E-B2/H2I11 HA 4060 SD2E-B2/L2I11 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1P1-GV-B HA 0028 SB-06B2-1P1-GV-B HA 0028	30069500 50 (1.97) 30069500 50 (1.97)
Stop valve in A channel		SD2E-B2/H2I11 HA 4060 SD2E-B2/L2I11 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1A2-GV-B HA 0028 SB-06B2-1A2-GV-B HA 0028	32067900 50 (1.97) 32067900 50 (1.97)
Stop valve in B channel		SD2E-B2/H2I11 HA 4060 SD2E-B2/L2I11 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1B2-GV-B HA 0028 SB-06B2-1B2-GV-B HA 0028	31062900 50 (1.97) 31062900 50 (1.97)
Stop valve in T channel		SD2E-B2/H2I11 HA 4060 SD2E-B2/L2I11 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1T2-GV-B HA 0028 SB-06B2-1T2-GV-B HA 0028	30453800 50 (1.97) 30453800 50 (1.97)
Stop valve in A and B channels		SD2E-B2/H2I11 HA 4060 SD2E-B2/L2I11 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-2C2-GV-B HA 0028 SB-06B2-2C2-GV-B HA 0028	31761100 50 (1.97) 31761100 50 (1.97)
Connecting valve A → B		SD2E-B2/H2I12 HA 4060 SD2E-B2/L2I12 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1AB2-GV-B HA 0028 SB-06B2-1AB2-GV-B HA 0028	30987000 50 (1.97) 30987000 50 (1.97)
Unloading valve P → T		SD2E-B2/H2I12 HA 4060 SD2E-B2/L2I12 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1PT2-GV-B HA 0028 SB-06B2-1PT2-GV-B HA 0028	30052800 50 (1.97) 30052800 50 (1.97)
Unloading valve A → T		SD2E-B2/H2I12 HA 4060 SD2E-B2/L2I12 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1AT2-GV-B HA 0028 SB-06B2-1AT2-GV-B HA 0028	30568900 50 (1.97) 30568900 50 (1.97)
Unloading valve B → T		SD2E-B2/H2I12 HA 4060 SD2E-B2/L2I12 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-1BT2-GV-B HA 0028 SB-06B2-1BT2-GV-B HA 0028	30708400 50 (1.97) 30708400 50 (1.97)
Unloading valves A → T, B → T		SD2E-B2/H2I12 HA 4060 SD2E-B2/L2I12 HA 4060	60 (15.9) 50 (13.2)	SB-06B2-2D2-GV-B HA 0028 SB-06B2-2D2-GV-B HA 0028	30143800 50 (1.97) 30143800 50 (1.97)

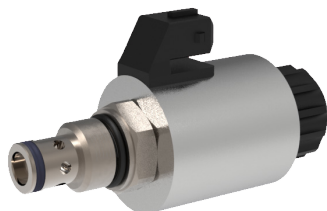


* block only

Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
SD2E-B2/H	HA 4060	350 (5080)	60 (15.9)	Screw-in cartridge 2/2 directional control valve, spool type (C-10-2)
SD2E-B2/L	HA 4060	250 (3630)	50 (13.2)	Screw-in cartridge 2/2 directional control valve, spool type, lightline design (with reduced performance) (C-10-2)

SD2E-B2/H

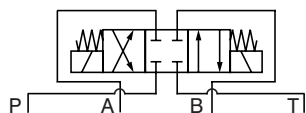


SD2E-B2/L



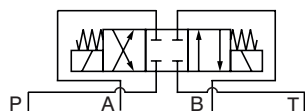
Poppet Valves, Direct Acting

Poppet valves, built in modular block, are leak proof and are commonly used as stop valves, safety, connecting or unloading valves. The direct acting valves are bidirectional valves and can be used in both flow directions.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Stop valve in P channel		ROE3-042S6MP06 HA 4073 SD1E-A2/H2S6 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1P1-GV-B HA 0028	40 (1.58) 30970100 50 (1.97)
Stop valve in A channel		ROE3-042S6MA06 HA 4073 SD1E-A2/H2S6 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1A1-GV-B HA 0028	40 (1.58) 28063500 50 (1.97)
Stop valve in B channel		ROE3-042S6MB06 HA 4073 SD1E-A2/H2S6 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1B1-GV-B HA 0028	40 (1.58) 30677500 50 (1.97)
Stop valve in A and B channels		ROE3-042S6MC06 HA 4073 SD1E-A2/H2S6 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-2C1-GV-B HA 0028	40 (1.58) 28063600 50 (1.97)
Safety (stop) valve in P channel		ROE3-042S5MP06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1P1-GV-B HA 0028	40 (1.58) 30970100 50 (1.97)
Safety (stop) valve in A channel		ROE3-042S5MA06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1A1-GV-B HA 0028	40 (1.58) 28063500 50 (1.97)
Safety (stop) valve in B channel		ROE3-042S5MB06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1B1-GV-B HA 0028	40 (1.58) 30677500 50 (1.97)

* block only



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Safety (stop) valves in A and B channels		ROE3-042S5MC06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-2C1-GV-B HA 0028	40 (1.58) 28063600 50 (1.97)
Connecting valve A → B		ROE3-042S5MX06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1AB2-GV-B HA 0028	40 (1.58) 30122800 50 (1.97)
Unloading valve P → T		ROE3-042S5MG06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1PT2-GV-B HA 0028	40 (1.58) 31474200 50 (1.97)
Unloading valve A → T		ROE3-042S5MD06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1AT2-GV-B HA 0028	40 (1.58) 30159400 50 (1.97)
Unloading valve B → T		ROE3-042S5ME06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-1BT2-GV-B HA 0028	40 (1.58) 30677800 50 (1.97)
Unloading valves A → T, B → T		ROE3-042S5MF06 HA 4073 SD1E-A2/H2S5 HA 4070	25 (6.6) 30 (7.9)	SB-06A2-2D2-GV-B HA 0028	40 (1.58) 30855200 50 (1.97)



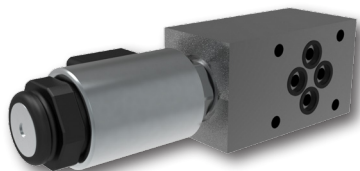
* block only

Top blanking plate for B-port control P → B or B → T		ROE3-042S5MJ06 HA 4073	25 (6.6)		40 (1.58)
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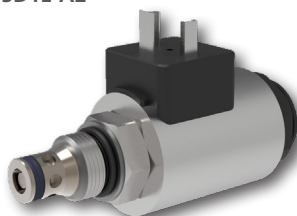
Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
ROE3-042xxxx06	HA 4073	250 (3630)	25 (6.6)	2/2 poppet valve, direct acting, built-into modular block
SD1E-A2	HA 4070	350 (5080)	30 (7.9)	Screw-in cartridge 2/2 poppet valve, direct acting (C-8-2)

ROE3-04

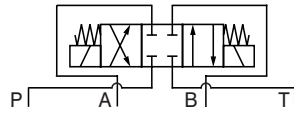


SD1E-A2



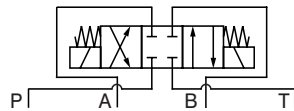
Poppet Valves, Pilot Operated

Pilot operated poppet valves close leak free only in one direction, according to the valve symbol. In the opposite direction the valve is open.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Stop valve in P channel		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1P1-GV-B HA 0028 SB-06B2-1P1-GV-B HA 0028	30069500 50 (1.97) 30069500 50 (1.97)
Stop valve in A channel, flow direction from the actuator		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1A1-GV-B HA 0028 SB-06B2-1A1-GV-B HA 0028	30021500 50 (1.97) 30021500 50 (1.97)
Stop valve in A channel, flow direction to the actuator		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1A2-GV-B HA 0028 SB-06B2-1A2-GV-B HA 0028	32067900 50 (1.97) 32067900 50 (1.97)
Stop valve in B channel, flow direction from the actuator		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1B1-GV-B HA 0028 SB-06B2-1B1-GV-B HA 0028	30708100 50 (1.97) 30708100 50 (1.97)
Stop valve in B channel, flow direction to the actuator		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1B2-GV-B HA 0028 SB-06B2-1B2-GV-B HA 0028	31062900 50 (1.97) 31062900 50 (1.97)
Stop valve in T channel		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1T2-GV-B HA 0028 SB-06B2-1T2-GV-B HA 0028	30453800 50 (1.97) 30453800 50 (1.97)
Stop valves in A and B channels, flow direction from the actuator		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-2C1-GV-B HA 0028 SB-06B2-2C1-GV-B HA 0028	30119500 50 (1.97) 30119500 50 (1.97)
Stop valves A and B channels, flow direction to the actuator		SD3E-B2/H2O2 HA 4063 SD3E-B2/L2O2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-2C2-GV-B HA 0028 SB-06B2-2C2-GV-B HA 0028	31761100 50 (1.97) 31761100 50 (1.97)
Safety (stop) valve in P channel		SD3E-B2/H2L2 HA 4063 SD3E-B2/L2L2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1P1-GV-B HA 0028 SB-06B2-1P1-GV-B HA 0028	30069500 50 (1.97) 30069500 50 (1.97)
Safety (stop) valve in A channel, flow direction from the actuator		SD3E-B2/H2L2 HA 4063 SD3E-B2/L2L2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1A1-GV-B HA 0028 SB-06B2-1A1-GV-B HA 0028	30021500 50 (1.97) 30021500 50 (1.97)
Safety (stop) valve in A channel, flow direction to the actuator		SD3E-B2/H2L2 HA 4063 SD3E-B2/L2L2 HA 4063	75 (19.8) 60 (15.9)	SB-06B2-1A2-GV-B HA 0028 SB-06B2-1A2-GV-B HA 0028	32067900 50 (1.97) 32067900 50 (1.97)

* block only



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Safety (stop) valve in B channel, flow direction from the actuator		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-1B1-GV-B HA 0028	30708100 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-1B1-GV-B HA 0028	30708100 50 (1.97)
Safety (stop) valve in B channel, flow direction to the actuator		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-1B2-GV-B HA 0028	31062900 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-1B2-GV-B HA 0028	31062900 50 (1.97)
Safety (stop) valve in T channel		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-1T2-GV-B HA 0028	30453800 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-1T2-GV-B HA 0028	30453800 50 (1.97)
Safety (stop) valves in A and B channels, flow direction from the actuator		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-2C1-GV-B HA 0028	30119500 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-2C1-GV-B HA 0028	30119500 50 (1.97)
Safety (stop) valves in A and B channels, flow direction to the actuator		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-2C2-GV-B HA 0028	31761100 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-2C2-GV-B HA 0028	31761100 50 (1.97)
Connecting valve A → B		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-1AB2-GV-B HA 0028	30987000 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-1AB2-GV-B HA 0028	30987000 50 (1.97)
Unloading valve P → T		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-1PT2-GV-B HA 0028	30052800 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-1PT2-GV-B HA 0028	30052800 50 (1.97)
Unloading valve A → T		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-1AT2-GV-B HA 0028	30568900 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-1AT2-GV-B HA 0028	30568900 50 (1.97)
Unloading valve B → T		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-1BT2-GV-B HA 0028	30708400 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-1BT2-GV-B HA 0028	30708400 50 (1.97)
Unloading valves A → T, B → T		SD3E-B2/H2L2 HA 4063	75 (19.8)	SB-06B2-2D2-GV-B HA 0028	30143800 50 (1.97)
		SD3E-B2/L2L2 HA 4063	60 (15.9)	SB-06B2-2D2-GV-B HA 0028	30143800 50 (1.97)

* block only

Valves:

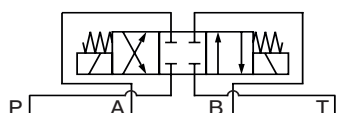
Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
SD3E-B2/H	HA 4063	420 (6090)	75 (19.8)	Screw-in cartridge 2/2 poppet valve, pilot operated (C-10-2)
SD3E-B2/L	HA 4063	250 (3630)	60 (15.9)	Screw-in cartridge 2/2 poppet valve, pilot operated, lightline design (with reduced performance) (C-10-2)

SD3E-B2

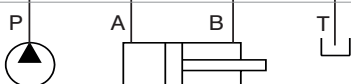


Check Valves

Check valves enable the fluid flow only in one direction. They are often connected to the pump pressure pipeline to prevent a backflow caused by excessive load on the actuator. The modular block can be provided with one or two built-in check valves. The free flow direction can be chosen.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Check valve in P channel, flow direction to the actuator		MVJ3-06P HA 5018 SC1F-B2 HA 5017	50 (13.2) 120 (31.7)	SB-06B2-1P2-GV-B HA 0028	40 (1.58) 30018100 50 (1.97)
Check valve in A channel, flow direction from the actuator		MVJ3-06A HA 5018 SC1F-B2 HA 5017	50 (13.2) 120 (31.7)	SB-06B2-1A2-GV-B HA 0028	40 (1.58) 32067900 50 (1.97)
Check valve in B channel, flow direction from the actuator		MVJ3-06B HA 5018 SC1F-B2 HA 5017	50 (13.2) 120 (31.7)	SB-06B2-1B2-GV-B HA 0028	40 (1.58) 31062900 50 (1.97)
Check valve in T channel, flow direction from the actuator		MVJ3-06T HA 5018 SC1F-B2 HA 5017	50 (13.2) 120 (31.7)	SB-06B2-1T1-GV-B HA 0028	40 (1.58) 31648000 50 (1.97)
Check valve in A channel, flow direction to the actuator		MVJ3-06C HA 5018 SC1F-B2 HA 5017	50 (13.2) 120 (31.7)	SB-06B2-1A1-GV-B HA 0028	40 (1.58) 30021500 50 (1.97)
Check valve in B channel, flow direction to the actuator		MVJ3-06D HA 5018 SC1F-B2 HA 5017	50 (13.2) 120 (31.7)	SB-06B2-1B1-GV-B HA 0028	40 (1.58) 30708100 50 (1.97)
Check valves in A and B channels, flow direction to the actuator		MVJ3-06AB HA 5018 SC1F-B2 HA 5017	50 (13.2) 120 (31.7)	SB-06B2-2C1-GV-B HA 0028	40 (1.58) 30119500 50 (1.97)
Check valves in P and T channels, flow direction P to the actuator and T from the actuator		MVJ3-06PT HA 5018	50 (13.2)		40 (1.58)



* block only

Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
MVJ3-06	HA 5018	350 (5080)	50 (13.2)	Check valve built-into modular block
SC1F-B2	HA 5017	420 (6090)	120 (31.7)	Screw-in cartridge check valve (C-10-2)

MVJ3-06

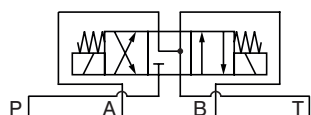


SC1F-B2



Check Valves, Pilot to Open

Pilot operated check valves are used for load holding when the pump is switched off.
The valve can be built in A, B or both channels of modular block according to acting direction of the load.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Pilot operated valve in A channel, control pressure from B		2RJV1-06/MA HA 5021	60 (15.9)		40 (1.58)
Pilot operated valve in B channel, control pressure from A		2RJV1-06/MB HA 5021	60 (15.9)		40 (1.58)
Pilot operated valves in A and B channels		2RJV1-06/MC HA 5021	60 (15.9)		40 (1.58)



* block only

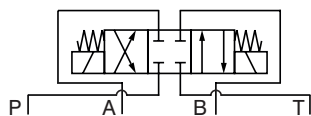
Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
2RJV1-06/M	HA 5021	320 (4640)	60 (15.9)	Pilot operated check valve built into modular block



Load Shuttle Valves

The valves connect the output channel with one of two input channels depending on the pressure value. They are often used for pressure (load) sensing at a double-acting actuator.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Load shuttle valve sensing the pressure in A and B channels of double-acting actuator		LV1-063/M HA 5030	40 (11)		40 (1.58)



* block only

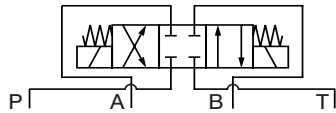
Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
LV1-063/M	HA 5030	320 (4640)	40 (11)	Load shuttle valve built into modular block



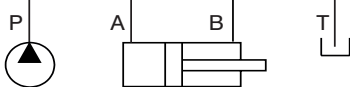
Pressure Relief Valves, Direct Acting

Pressure relief valves limit the maximum system pressure and protect the system against overloading. They are connected parallel to the pump or actuator.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Pressure relief valve in P channel (P → T)		VPP2-04/MP06 HA 5094 SR1A-B2 HA 5064	40 (11) 60 (15.9)	SB-06B2-1PT1-GV-B HA 0028	40 (1.58) 30003600 50 (1.97)
Pressure relief valve in A channel (A → T)		VPP2-04/MA06 HA 5094 SR1A-B2 HA 5064	40 (11) 60 (15.9)	SB-06B2-1AT1-GV-B HA 0028	40 (1.58) 30003800 50 (1.97)
Pressure relief valve in B channel (B → T)		VPP2-04/MB06 HA 5094 SR1A-B2 HA 5064	40 (11) 60 (15.9)	SB-06B2-1BT1-GV-B HA 0028	40 (1.58) 30021200 50 (1.97)
Pressure relief valve in A channel (A → B)		VPP2-04/ME06 HA 5094 SR1A-B2 HA 5064	40 (11) 60 (15.9)	SB-06B2-1AB1-GV-B HA 0028	40 (1.58) 30380500 50 (1.97)
Pressure relief valve in B channel (B → A)		SR1A-B2 HA 5064	60 (15.9)	SB-06B2-1AB2-GV-B HA 0028	30987000 50 (1.97)
Crossport pressure relief valves (A ↔ B)		VPP2-04/MC06 HA 5094 SR1A-B2 HA 5064	40 (11) 60 (15.9)	SB-06B2-2C3-GV-B HA 0028	40 (1.58) 28064300 50 (1.97)
Two independent pressure relief valves (A → T and B → T)		VPP2-04/MD06 HA 5094 SR1A-B2 HA 5064	40 (11) 60 (15.9)	SB-06B2-2D1-GV-B HA 0028	40 (1.58) 30755800 50 (1.97)

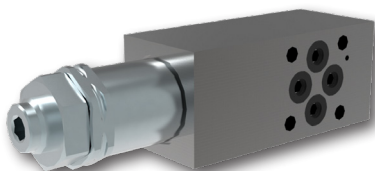
* block only



Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
VPP2-04/xx06	HA 5094	320 (4640)	40 (11)	Pressure relief valve, direct acting, built into modular block
SR1A-B2	HA 5064	420 / 250 (6090 / 3630)	60 (15.9)	Screw-in cartridge pressure relief valve, direct acting (C-10-2)

VPP2-04/xx06

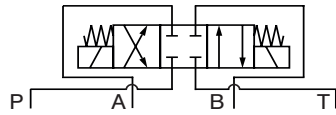


SR1A-B2



Pressure Relief Valves, Pilot Operated

Pressure relief valves limit the maximum system pressure and protect the system against overloading. They are connected parallel to the pump or actuator.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Pressure relief valve in P channel (P → T)		VPN1-06/MP HA 5160 SR4A-B2 HA 5065	70 (18.5) 100 (26.4)	SB-06B2-1PT1-GV-B HA 0028	40 (1.58) 30003600 50 (1.97)
Pressure relief valve in A channel (A → T)		VPN1-06/MA HA 5160 SR4A-B2 HA 5065	70 (18.5) 100 (26.4)	SB-06B2-1AT1-GV-B HA 0028	40 (1.58) 30003800 50 (1.97)
Pressure relief valve in B channel (B → T)		VPN1-06/MB HA 5160 SR4A-B2 HA 5065	70 (18.5) 100 (26.4)	SB-06B2-1BT1-GV-B HA 0028	40 (1.58) 30021200 50 (1.97)
Pressure relief valve in A channel (A → B)		SR4A-B2 HA 5065	100 (26.4)	SB-06B2-1AB1-GV-B HA 0028	30380500 50 (1.97)
Pressure relief valve in B channel (B → A)		SR4A-B2 HA 5065	100 (26.4)	SB-06B2-1AB2-GV-B HA 0028	30987000 50 (1.97)
Crossport pressure relief valves (A ↔ B)		VPN1-06/MC HA 5160 SR4A-B2 HA 5065	70 (18.5) 100 (26.4)	SB-06B2-2C3-GV-B HA 0028	40 (1.58) 28064300 50 (1.97)
Two independent pressure relief valves (A → T and B → T)		VPN1-06/MD HA 5160 SR4A-B2 HA 5065	70 (18.5) 100 (26.4)	SB-06B2-2D1-GV-B HA 0028	40 (1.58) 30755800 50 (1.97)

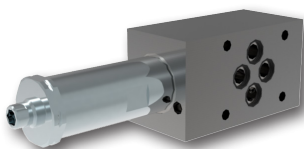
* block only



Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
VPN1-06/M	HA 5160	320 (4640)	70 (18.5)	Pressure relief valve, pilot operated, built into modular block
SR4A-B2	HA 5065	350 / 100 (5080 / 1450)	100 (26.4)	Screw-in cartridge pressure relief valve, pilot operated (C-10-2)

VPN1-06/M

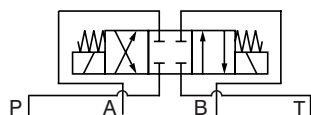


SR4A-B2



Pressure Relief Valves Operated by Solenoid

The solenoid operated relief valves switch between two adjusted pressure values or adjusted maximum and minimum system pressure (combined relief and unloading function). The pressure values are adjusted mechanically with the help of two adjusting screws.



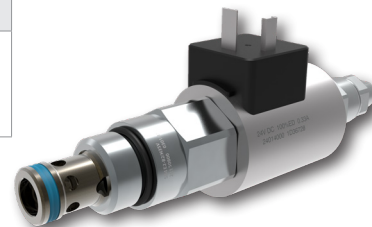
Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Pressure relief / unloading valve in P channel (P → T), switching between adjusted p_1 and p_2		SR4E-B2 HA 5068	60 (15.9)	SB-06B2-1PT1-GV-B HA 0028	30003600 50 (1.97)



* block only

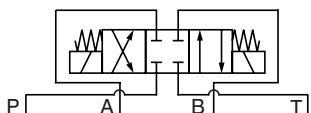
Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
SR4E-B2	HA 5068	350 / 100 (5080 / 1450)	60 (15.9)	Screw-in cartridge pressure relief valve operated by solenoid (C-10-2)

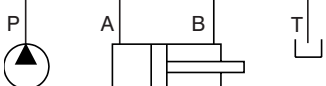


Proportional Pressure Relief Valves

The valves enable continuous adjustment of the maximum system pressure depending on the command control signal. The valves with a negative characteristic create the maximum pressure at zero control signal (opposite function)



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Continuous adjustment of maximum pressure in P channel (P → T)		SR4P2-B2 HA 5117	80 (21.1)	SB-06B2-1PT1-GV-B HA 0028	30003600 50 (1.97)
		SRN4P1-B2 HA 5138	80 (21.1)	SB-06B2-1PT1-GV-B HA 0028	30003600 50 (1.97)

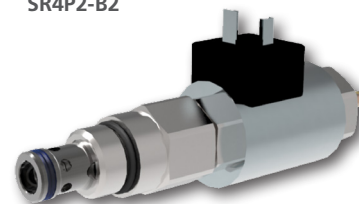


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Valves:

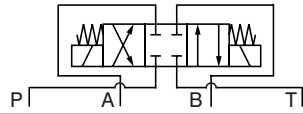
Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
SR4P2-B2	HA 5117	350 / 100 (5080 / 1450)	80 (21.1)	Screw-in cartridge proportional pressure relief valve, pilot operated (C-10-2)
SRN4P1-B2	HA 5138	350 / 100 (5080 / 1450)	80 (21.1)	Screw-in cartridge proportional pressure relief valve with negative characteristic, pilot operated (C-10-2)

SR4P2-B2



Pressure Reducing Valves, Direct Acting

Reducing valves maintain a constant set pressure. They are often used for adjusting the pressure on an actuator, it means the force acting on the piston rod or the torque on the shaft of hydraulic motor. Three-way valves protect the pipeline leading to the actuator against pressure overloading as a relief valves and allow the back flow from the actuator to the tank.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Reduced pressure setting in P channel, additionally gauge port M		VRP2-06-P HA 5145 SP2A-B3 HA 5146	50 (13.2) 60 (15.9)	SB-06B3-1P2-GV-B HA 0028	40 (1.58) 30786400 50 (1.97)
Reduced pressure setting in A channel, bypass check valve for back flow, additionally gauge port M		VRP2-06-A HA 5145	50 (13.2)		45 (1.77)
Reduced pressure setting in B channel, bypass check valve for back flow, additionally gauge port M		VRP2-06-E HA 5145	50 (13.2)		45 (1.77)
Reduced pressure setting in P channel, the valve controlled by pressure in B channel, additionally gauge port M		VRP2-06-B HA 5145	50 (13.2)		40 (1.58)

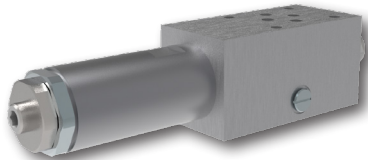


* block only

Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)] P, A, B / T	Max. flow [l/min (GPM)]	Description
VRP2-06	HA 5145	350 / 210 (5080 / 3050)	50 (13.2)	Pressure reducing-relieving valve, direct acting, built into modular block
SP2A-B3	HA 5146	420 / 200 (6090 / 2900)	60 (15.9)	Screw-in cartridge reducing-relieving valve, direct acting (C-10-3)

VRP2-06

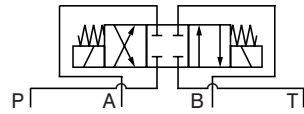


SP2A-B3



Pressure Reducing Valves, Pilot Operated

Reducing valves maintain a constant set pressure. They are often used for adjusting the pressure on an actuator, it means the force acting on the piston rod or the torque on the shaft of hydraulic motor. Three-way valves protect the pipeline leading to the actuator against pressure overloading as a relief valves and allow the back flow from the actuator to the tank. Pilot operated valves need permanent small flow through the pilot stage to assure the continuous constant pressure regulation.



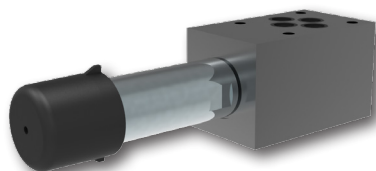
Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Reduced pressure setting in P channel, additionally gauge port M		VRN2-06/MP HA 5155 SP4A-B3 HA 5144	40 (11) 60 (15.9)	 SB-06B3-1P2-GV-B HA 0028	45 (1.77) 30786400 50 (1.97)
Reduced pressure setting in A channel, additionally gauge port M		SP4A-B3 HA 5144	60 (15.9)	SB-06B3-1A2-GV-B HA 0028	28064400 50 (1.97)
Reduced pressure setting in A channel, bypass check valve for back flow, additionally gauge port M		VRN2-06/MA HA 5155	40 (11)		45 (1.77)
Reduced pressure setting in B channel, bypass check valve for back flow, additionally gauge port M		VRN2-06/MB HA 5155	40 (11)		45 (1.77)
Reduced pressure setting in B channel, additionally gauge port M		VRN2-06/MC HA 5155	40 (11)		45 (1.77)

* block only

Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)] P, A, B / T	Max. flow [l/min (GPM)]	Description
VRN2-06	HA 5155	320 / 160 (4640 / 2320)	40 (11)	Pressure reducing-relieving valve, pilot operated, built into modular block
SP4A-B3	HA 5144	350 / 100 (5080 / 1450)	60 (15.9)	Screw-in cartridge reducing-relieving valve, pilot operated (C-10-3)

VRN2-06

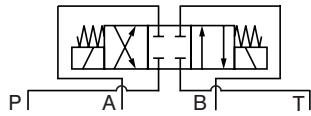


SP4A-B3



Proportional Pressure Reducing Valves

Proportional reducing valves are used for remote continuous adjusting of the pressure on an actuator, it means the force acting on the piston rod or the torque on the shaft of hydraulic motor. Three-way valves protect the pipeline leading to the actuator against pressure overloading as a relief valves and allow the back flow from the actuator to the tank. The valves with a negative characteristic create the maximum pressure at zero control signal (opposite function).



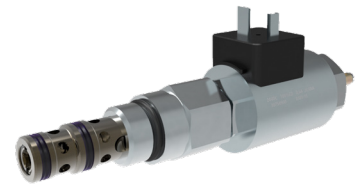
Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Reduced pressure setting in P channel, additionally gauge port M		SP4P2-B3 HA 5123	60 (15.9)	SB-06B3-1P2-GV-B HA 0028	30786400 50 (1.97)
		SRN4P1-B2 HA 5139	60 (15.9)	SB-06B3-1P2-GV-B HA 0028	30786400 50 (1.97)

* block only

Valves:

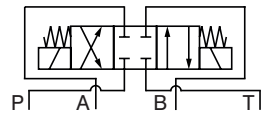
Product name	Datasheet no.	Max. pressure [bar (PSI)] P / T	Max. flow [l/min (GPM)]	Description
SP4P2-B3	HA 5123	350 / 100 (5080 / 1450)	60 (15.9)	Screw-in cartridge proportional pressure reducing valve, pilot operated (C-10-3)
SPN4P1-B3	HA 5139	350 / 100 (5080 / 1450)	60 (15.9)	Screw-in cartridge proportional pressure reducing valve with negative characteristic, pilot operated (C-10-3)

SP4P2-B3



Sequence Spool Valve, Hydraulically Operated

The sequence valve connects inlet pressure port to the output port after reaching the set inlet pressure acting on the spool face.



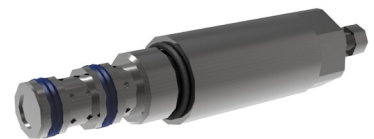
Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
The P port is connected to the pump when the pressure set on the sequence valve is reached		SS4A-A3 HA 5049	30 (7.9)	SB-06A3-1P3-GV-B HA 0028	31627600 50 (1.97)

* block only

Valves:

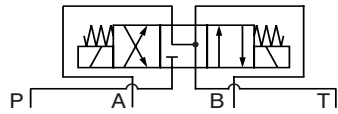
Product name	Datasheet no.	Max. pressure [bar (PSI)] operating / setting	Max. flow [l/min (GPM)]	Description
SS4A-A3	HA 5049	350 / 240 (5080 / 3480)	30 (7.9)	Screw-in cartridge sequence spool valve, hydraulically operated (C-8-3)

SS4A-A3

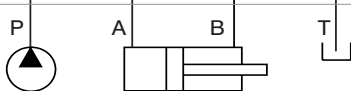


Overcenter Valves

Overcenter valves ensure the load position when the pump is off and enable continuous, safe movement control of the load acting in the movement (negative) direction of the actuator, which is accelerated by load. Non-balanced and fully balanced valves with ventilation of spring space are available.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Non-balanced overcenter valve in A channel, controlled by pressure from B channel		SO5A-BP3/H HA 5199	40 (11)	SB-06BP3-1A1-GV-B HA 0028	41072900 53 (2.09)
Non-balanced overcenter valve in B channel, controlled by pressure from A channel		SO5A-BP3/H HA 5199	40 (11)	SB-06BP3-1B1-GV-B HA 0028	41054200 53 (2.09)
Non-balanced overcenter valves in A and B channels, crossport controlled		SO5A-BP3/H HA 5199	40 (11)	SB-06BP3-2C2-GV-B HA 0028	41047200 53 (2.09)
Fully balanced overcenter valve in A channel, controlled by pressure from B channel		SOB5A-BP3/H HA 5197	40 (11)	SB-06BP3-1A1-GV-B HA 0028	41072900 53 (2.09)
Fully balanced overcenter valve in B channel, controlled by pressure from A channel		SOB5A-BP3/H HA 5197	40 (11)	SB-06BP3-1B1-GV-B HA 0028	41054200 53 (2.09)
Fully balanced overcenter valves in A and B channels, crossport controlled		SOB5A-BP3/H HA 5197	40 (11)	SB-06BP3-2C2-GV-B HA 0028	41047200 53 (2.09)



* block only

Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
SO5A-BP3/H	HA 5199	420 / 350 (6090 / 5080)	40 (11)	Screw-in cartridge overcenter valve, non-balanced
SOB5A-BP3/H	HA 5197	420 / 350 (6090 / 5080)	40 (11)	Screw-in cartridge overcenter valve, fully balanced with atmospheric ventilation

SO5A-BP3/H

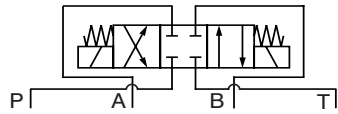


SOB5A-BP3/H



Throttle Valves with Bypass Check Valves

Throttle valves are used as flow restrictors for flow regulation and thus velocity regulation of actuator. The flow can be regulated upstream or downstream the actuator depending on bypass check valve orientation which can be changed very simply by turning the valve by 180°. The valve rotation is possible thanks to additional plate with sealing rings.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Throttle valve in A channel, flow regulation upstream the actuator		2VS3-06-A HA 5051	80 (21.1)		40 (1.58) (block + plate)
Throttle valve in B channel, flow regulation upstream the actuator		2VS3-06-B HA 5051	80 (21.1)		40 (1.58) (block + plate)
Throttle valve in A and B channels, flow regulation upstream the actuator		2VS3-06-C HA 5051	80 (21.1)		40 (1.58) (block + plate)
Throttle valve in A channel, flow regulation downstream the actuator		2VS3-06-A HA 5051	80 (21.1)	Modular block rotated by 180°	40 (1.58) (block + plate)
Throttle valve in B channel, flow regulation downstream the actuator		2VS3-06-B HA 5051	80 (21.1)	Modular block rotated by 180°	40 (1.58) (block + plate)
Throttle valve in A and B channels, flow regulation downstream the actuator		2VS3-06-C HA 5051	80 (21.1)	Modular block rotated by 180°	40 (1.58) (block + plate)



* block only

Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
2VS3-06	HA 5051	320 (4640)	80 (21.1)	Double throttle valve with bypass check valves in the form of modular block

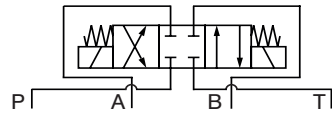
The flow restriction upstream / downstream the actuator is achieved by rotating the symmetric valve block and using the separate plate with sealing rings.



15932100 - Plate and 4 seals

Throttle Valves

Throttle valves are used as a flow restrictor for flow regulation and thus velocity regulation of actuator.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Throttle valve in P channel		ST21A-A2 HA 5133 ST21A-B2 HA 5134	20 (5.3) 140 (37)	SB-06A2-1P1-GV-B HA 0028 SB-06B2-1P1-GV-B HA 0028	30970100 50 (1.97) 30069500 50 (1.97)
Throttle valve in A channel		ST21A-A2 HA 5133 ST21A-B2 HA 5134	20 (5.3) 140 (37)	SB-06A2-1A2-GV-B HA 0028 SB-06B2-1A2-GV-B HA 0028	32184500 50 (1.97) 32067900 50 (1.97)
Throttle valve with bypass check valve in A channel		ST2C1A-A2 HA 5133	20 (5.3)	SB-06A2-1A2-GV-B HA 0028	32184500 50 (1.97)
Throttle valve in B channel		ST21A-A2 HA 5133 ST21A-B2 HA 5134	20 (5.3) 140 (37)	SB-06A2-1B2-GV-B HA 0028 SB-06B2-1B2-GV-B HA 0028	41836500 50 (1.97) 31062900 50 (1.97)
Throttle valve with bypass check valve in B channel		ST2C1A-A2 HA 5133	20 (5.3)	SB-06A2-1B2-GV-B HA 0028	41836500 50 (1.97)
Throttle valves in A and B channels		ST21A-A2 HA 5133 ST21A-B2 HA 5134	20 (5.3) 140 (37)	SB-06A2-2C2-GV-B HA 0028 SB-06B2-2C2-GV-B HA 0028	32265200 50 (1.97) 31761100 50 (1.97)
Throttle valves with bypass check valves in A and B channels		ST2C1A-A2 HA 5133	20 (5.3)	SB-06A2-2C2-GV-B HA 0028	32265200 50 (1.97)
Throttle valve in T channel		ST21A-A2 HA 5133 ST21A-B2 HA 5134	20 (5.3) 140 (37)	SB-06A2-1T1-GV-B HA 0028 SB-06B2-1T2-GV-B HA 0028	31396300 50 (1.97) 30453800 50 (1.97)

* block only



Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
ST21A-A2	HA 5133	320 (4600)	20 (5.3)	Screw-in cartridge throttle valve (C-8-2)
ST2C1A-A2	HA 5133	320 (4600)	20 (5.3)	Screw-in cartridge throttle valve with bypass check valve (C-8-2)
ST21A-B2	HA 5134	350 (5080)	140 (37)	Screw-in cartridge throttle valve (C-10-2)

ST21A-A2
ST2C1A-A2

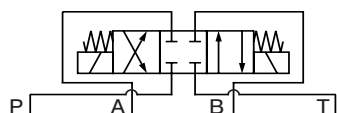


ST21A-B2

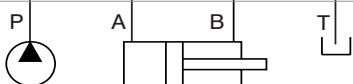


Flow Control Valves with Two-way Pressure Compensator

Flow control valves with two-way pressure compensator maintain a set flow rate independent of the pressure induced by load and supply pressure fluctuation. Constant pressure drop on the valve and thus the constant flow rate is maintained by throttling.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Flow control valve with 2-way pressure compensator in P channel		VSS3-062/M HA 5050 SF22A-B2 HA 5067	40 (11) 40 (11)	 SB-06B2-1P2-GV-B HA 0028	40 (1.58) 30018100 50 (1.97)
Flow control valve with 2-way pressure compensator in A channel, flow regulation upstream the actuator		VSS1-206-xA-11 HA 5032 SF22A-B2 HA 5067	22 (5.8) 40 (11)	 SB-06B2-1A1-GV-B HA 0028	40 (1.58) 30021500 50 (1.97)
Flow control valve with 2-way pressure compensator in A channel, flow regulation downstream the actuator		SF22A-B2 HA 5067	40 (11)	SB-06B2-1A2-GV-B HA 0028	32067900 50 (1.97)
Flow control valve with 2-way pressure compensator and bypass check valve in A channel, flow regulation upstream the actuator		VSS1-206-xB-11 HA 5032	22 (5.8)		40 (1.58)
Flow control valve with 2-way pressure compensator and bypass check valve in A channel, flow regulation downstream the actuator		VSS1-206-xC-11 HA 5032	22 (5.8)		40 (1.58)
Flow control valve with 2-way pressure compensator in B channel, flow regulation upstream the actuator		SF22A-B2 HA 5067	40 (11)	SB-06B2-1B1-GV-B HA 0028	30708100 50 (1.97)
Flow control valve with 2-way pressure compensator in B channel, flow regulation downstream the actuator		SF22A-B2 HA 5067	40 (11)	SB-06B2-1B2-GV-B HA 0028	31062900 50 (1.97)
Flow control valve with 2-way pressure compensator in T channel		SF22A-B2 HA 5067	40 (11)	SB-06B2-1T1-GV-B HA 0028	31648000 50 (1.97)

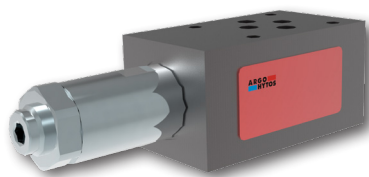


* block only

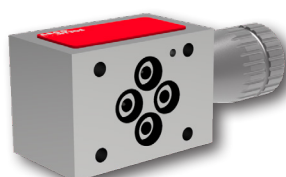
Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
VSS3-06/M	HA 5050	320 (4640)	40 (11)	Flow control valve with 2-way pressure compensator built into modular block
VSS1-206	HA 5032	320 (4640)	22 (5.8)	Flow control valve with 2-way pressure compensator and bypass check valve built into modular block
SF22A-B2	HA 5067	350 (5080)	40 (11)	Screw-in cartridge flow control valve with 2-way pressure compensator (C-10-2)

VSS3-06/M



VSS1-206

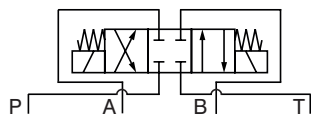


SF22A-B2



Flow Control Valves with Three-way Pressure Compensator Bypass Type

Flow control valves with three-way pressure compensator bypass type maintain a set flow rate independent of the pressure induced by load and supply pressure fluctuation. Constant pressure drop on the valve and thus the constant flow rate is maintained by dividing the flow. Undesired flow for actuator function is diverted to tank.



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Flow control valve with 3-way pressure compensator bypass type in P channel		VSS1-306 HA 5033	16 (4.2)		40 (1.58)
		SF32A-B3/H HA 5070	50 (13.2)	SB-06B3-1P4-GV-B HA 0028	33881200 60 (2.36)

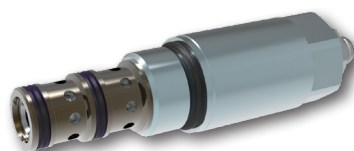


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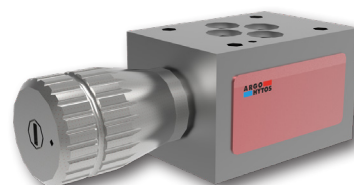
Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
VSS1-306	HA 5033	320 (4640)	16 (4.2)	Flow control valve with 3-way pressure compensator built into modular block
SF32A-B3/H	HA 5070	350 (5080)	50 (13.2)	Screw-in cartridge flow control valve with 3-way pressure compensator (C-10-3)

SF32A-B3/H

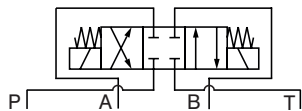


VSS1-306

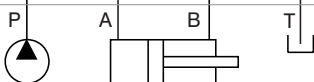


Pressure Compensators

Pressure compensators are used for stabilisation of pressure drop on valves. When used with proportional directional control valves they assure repeatability of flow regulation at the load or supply fluctuation. Two-way pressure compensator regulates the pressure drop by throttling of the flow, three-way pressure compensator by flow dividing. The two-way pressure compensator has two possible connections. Meter-in connection is used for positively acting load, meter-out connection is used for negatively acting load (in the moving direction of actuator).



Functional description	Functional symbol	Valve	Max. flow [l/min (GPM)]	Modular blocks	Ordering no.* Block height mm(in)
Two-way pressure compensator in P channel, meter-in connection, controlled by pressure from A channel, additionally port for LS regulation		TV2-062/MA HA 5166	35 (9.3)		40 (1.58)
Two-way pressure compensator in P channel, meter-in connection, controlled by pressure from B channel, additionally port for LS regulation		TV2-062/MB HA 5166	35 (9.3)		40 (1.58)
Two-way pressure compensator in P channel, meter-in connection, controlled by pressure from A or B channel via load shuttle valve, additionally port for LS regulation		TV2-062/MC HA 5166	35 (9.3)		40 (1.58)
Two-way pressure compensator in P channel, meter-in connection, controlled by pressure from A or B channel via load shuttle valve, additionally 2 ports for LS regulation		TV2-062/MCX HA 5166	35 (9.3)		40 (1.58)
Two-way pressure compensator with bypass check valve in A and B channels, meter-out connection		TV2-062/MD HA 5166	35 (9.3)		63.5 (2.5)
Two-way pressure compensator with bypass check valve in A channel, meter-out connection		TV2-062/ME HA 5166	35 (9.3)		63.5 (2.5)
Two-way pressure compensator with bypass check valve in B channel, meter-out connection		TV2-062/MF HA 5166	35 (9.3)		63.5 (2.5)
Three-way pressure compensator controlled by pressure from A channel		TV2-063/MA HA 5168	40 (11)		40 (1.58)
Three-way pressure compensator controlled by pressure from B channel		TV2-063/MB HA 5168	40 (11)		40 (1.58)
Three-way pressure compensator controlled by pressure from A and B channels via load shuttle valve		TV2-063/MC HA 5168	40 (11)		40 (1.58)



* block only

Valves:

Product name	Datasheet no.	Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
TV2-062/M	HA 5166	350 (5080)	35 (9.3)	Two-way pressure compensator built into modular block
TV2-063/M	HA 5168	320 (4640)	40 (11)	Three-way pressure compensator built into modular block

TV2-062/M



TV2-063/M



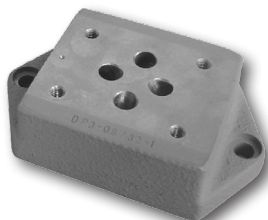
C. Subplates and Manifolds

Integrated modular blocks create a flexible control assembly, which is connected to the hydraulic circuit with the help of subplate or base block provided threaded side ports.

Subplates DP

Subplates DP-06 are used for connection of one (CETOP) valve with body or integrated modular assembly. The under side is provided with threaded ports for fittings and pipeline connection.

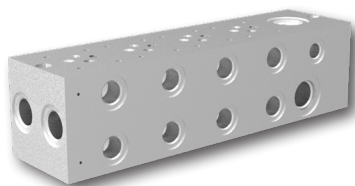
Product name	Datasheet no.	Material / Max. pressure [bar (PSI)]	Description
DP-06	HA 0002	Gray cast iron / 350 (5080)	Subplate



Parallel Circuit Manifolds with Side Ports

Parallel circuit manifolds DR2-06 enable multiple vertical integration by extending the number of connecting patterns (from 1 to 10). Plates are produced from low carbon steel or mechanically hardened aluminium alloy ENAW 7575, specified for working pressure up to 320 bar. The front section can be fitted optionally with a built-in pressure relief valve and unloading valve (P-T). Each section is designed to control one actuator.

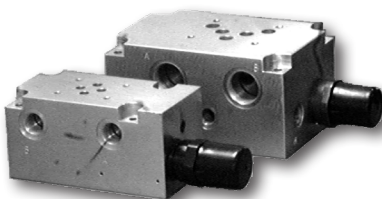
Product name	Datasheet no.	Material / Max. pressure [bar (PSI)]	Description
DR2-06	HA 0026	Aluminium alloy / 320 (4640) Steel / 350 (5080)	Parallel circuit manifolds with common P and T channels



Base Manifold

Base manifold DP6 with built-in pressure relief valve is designed for assembly of one (CETOP) valve with body or integrated modular assembly. It has been designed for hydraulic powerpacks but can be used separately.

Product name	Datasheet no.	Material / Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
DP6-06	HA 0012	Steel / 350 (5080)	50 (13.2)	Base manifold with built-in pressure relief valve



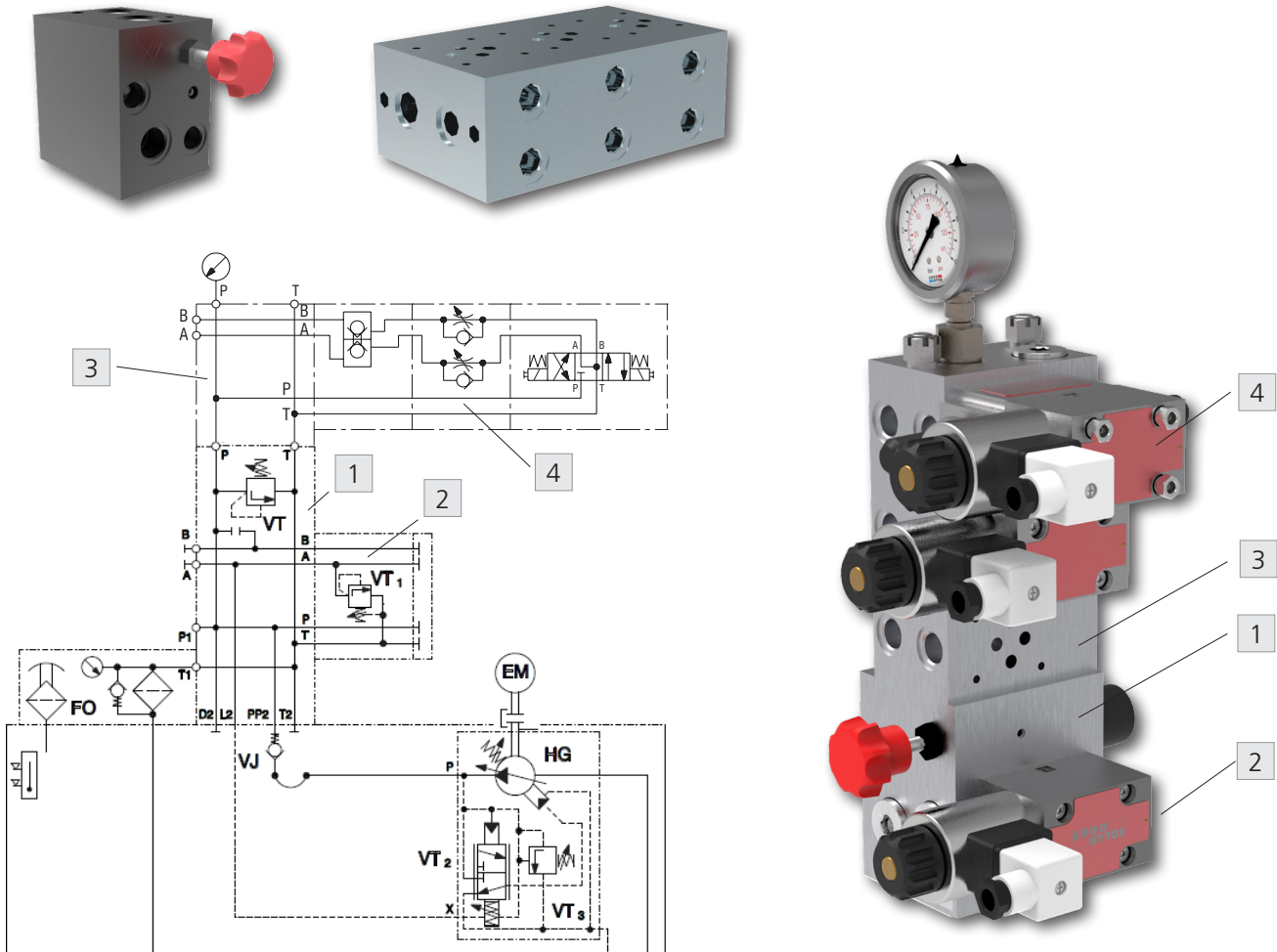
Base Manifolds with a Connected Parallel Circuit Manifolds

The base manifold is a multifunctional part for connection of parallel circuit manifold with groups of integrated valves, creating the control circuit. The base manifold enables connection to the pump and back pipeline in the building the complete hydraulic drives. The upper surface is designed for connection of PD06 parallel circuit manifold with vertically integrated modular valves. Side connecting pattern DN06 is designed for (CETOP) valve with body, which is used for drive control.

Product name	Datasheet no.	Material / Max. pressure [bar (PSI)]	Max. flow [l/min (GPM)]	Description
ZB06	HA 0010	Aluminium alloy / 250 (3630) Steel / 320 (4640)	50 (13.2)	Base manifold for power packs
PD06	HA 0006	Aluminium alloy / 250 (3630)		Parallel circuit manifold with common P and T channels designed for assembly to the base manifold ZB06

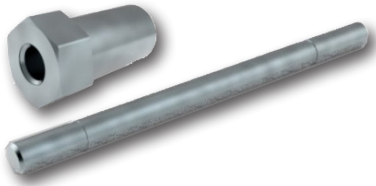
ZB06

PD06



Connection example of the hydraulic power pack using a base manifold (1) with a control valve (2) on the side face. The parallel circuit manifolds PD (3) with vertically grouped modular valves (4) is connected with bolts to the upper surface of the base manifold.

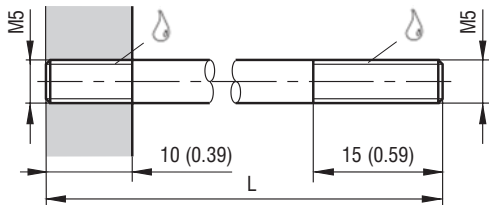
D. Fastening Material



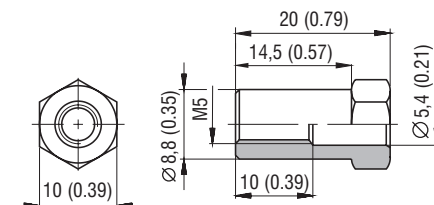
Fastening material for vertical integration of modular valves and the calculation of the length of studs and screws can be found in Datasheet no. HA 0020.

Metric Threads dimensions in millimeters (in)

Studrod M5xL (length L see the table)
Strength class - GR.8 ISO 10.9



Studnut M5



Calculating of Stud Length

Calculation formula: $L = LP + \sum HM + LB + LN$

L - total length of the studrod

LP - thread length projection into subplate / block = 10 mm (0.39 in)

$\sum HM$ - SUM of all heights of all installed sandwich valves

LB - length of directional valve projection = 37.3 mm (1.47 in)

LN - length of thread in the nut (LN_{min} - LN_{max}) = 6 mm (0.24 in) - 14 mm (0.55 in)

Studrods - order numbers of separate elements or kits

M5		Torque to 8.9 Nm (6.6 lbf.ft)			
Item	Length L	Weight	Item number		Max. pressure
	[mm]	kg / 100 pcs	1pc	Kit*	[bar]
Studrod	70	1.0	20197400	16103500	350
Studrod	77	1.1	15609500	16105100	350
Studrod	82	1.2	20197600	16103600	350
Studrod	88	1.2	16679400	16105200	350
Studrod	93	1.3	24233200	33884500	350
Studrod	98	1.4	20197800	16103700	350
Studrod	102	1.4	20197900	16103800	350
Studrod	110	1.6	15609700	16103900	350
Studrod	115	1.6	20198100	16108200	350
Studrod	120	1.8	20198200	23678300	350
Studrod	125	1.8	24233300	33884800	350
Studrod	130	1.8	15609600	16104000	350
Studrod	136	1.9	15609800	16104100	350
Studrod	144	2.0	20198500	16104200	350
Studrod	150	2.1	20198600	33885000	350
Studrod	158	2.2	20198700	33885200	320
Studrod	166	2.3	20198800	23686800	320
Studrod	170	2.4	16679500	16104300	320
Studrod	177	2.5	20199000	16108300	320
Studrod	180	2.5	20199100	16104500	320
Studrod	185	2.6	20199200	16104600	320
Studrod	190	2.7	20199300	23679200	320
Studrod	202	3.0	20199400	16105300	320
Studrod	210	3.1	20199500	16104700	250
Studrod	215	3.2	20199600	16104800	250
Studrod	222	3.3	20199700	16104900	250
Studrod	230	3.4	20199800	33885600	250
Studrod	242	3.4	23698400	23685200	250
Studrod	250	3.5	20199900	16105500	200
Studrod	255	3.6	20200000	16105000	200
Studrod	262	3.7	20200100	16105400	200
Nut	M5	0.7	15630800		

Caution!

*Kits include 4 studrods + 4 nuts

Remarks:

This document is intended to aid circuit creation by means of vertical integration and identification of modular blocks in relation to their individual valves. If the required modular valve was not found in the above selection, we recommend you the following procedure:

- › Select the required valve from the constantly updated product catalogue at www.argo-hytos.com
- › Available blocks for specific valve are listed in the table "Technical Data" of datasheet.
- › Select the appropriate modular block for screw-in cartridge valves according to type and function of the valve in datasheet no. HA 0028.
- › In the same way, you can choose in-line body for screw-in cartridge valves from datasheet SB 0018.
- › If you need to make the cavity for screw-in cartridge valve in your own block, cavity drawings and the associated tools are found in datasheet SMT 0029.
- › It is possible to realize different hydraulic function using the unified type of block. E.g. the same block type 1PT1 can be used for pressure relief valve and appropriate type of unloading valve.
- › Generally, there is a recommendation to not connect pressure line (P) to the electric operated valves in such way that the solenoid core tube is loaded by undesired pressure peaks. These valves should be connected to the pump in radial direction.
- › Connection symbols of pilot operated poppet valves (one-way valves) and pressure valves show their connection which is necessary for their proper function. For better understanding see data sheets of the valves.
- › If the required modular blocks is not listed, please contact our sales department.