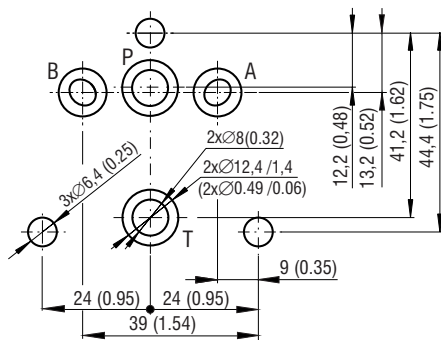
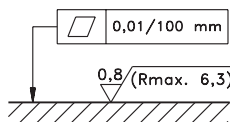
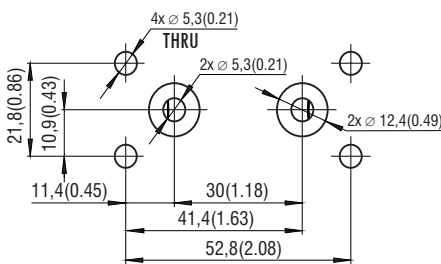


Connection plate diagram  
for horizontal integration



Connection plate diagram  
for vertical integration



Required surface quality of  
the counterpart

### Technical Features

- › Compact modular valve assembly for the control of fluid flow, direction and pressure
- › Horizontal integration of up to 8 modules with end inlet or 16 modules with center inlet
- › Convenient compact solution for both mobile applications and small hydraulic power packs
- › Solenoid operated directional control valves in sections enable vertical integration
- › High block variability utilizing both vertical and horizontal modular integration
- › Blocks with valve cavities C-08 (3/4-16 UNF) enable the use of wide range of screw-in cartridge valves from the production program
- › Simple creation of a hydraulic circuit using stocked items without having to produce a custom block
- › Optional inlet block with proportional flow control up to  $Q = 45$  l/min and pressure drop stabilization
- › End valve blocks help to save space and costs
- › Connection threads of inlet ports P, T: 3/8" BSPP or SAE 8 (3/4-16 UNF)
- › Connection threads of output work ports A, B: 1/4" BSPP or SAE 6 (9/16-18 UNF)
- › Standard components are made from various materials. Refer to individual catalog sections
- › Optional increased surface corrosion protection 520 h in NSS acc. to ISO 9227, e.g. for mobile applications

### Functional Description

Modular blocks designed to control one or more actuators are characterized by compactness and high variability. They are designed for both stationary and mobile applications where the maximum pressure is 250 bar and the flow rate does not exceed 20 l/min per section. The total maximum flow through inlet channel P is 60 l/min.

To connect the assembly to the hydraulic circuit, central inlet plates with side ports P, T, or inlet plates and blocks with end ports P, T can be used. Inlet blocks can be configured with optional valves to create additional functionality such as system relief or unloading. Limited length of studs allows a maximum horizontal integration of 8 blocks when using inlet plate or block. Using O1 or O2 type central inlet plate 8 blocks from both sides can be integrated to create an assembly of 16 blocks. Inlet ports P, T are available with threads:

G 3/8, G 1/2 or SAE 8 (3/4-16 UNF).

The outputs for connection of actuators A, B are found on the upper surface of the blocks. 22. The work ports A, B for connection to the actuators are on the upper surface of the blocks and available with threads: G 1/4, G 3/8 or SAE 6 (9/16-18 UNF).

Gauge ports are provided with threads G 1/4 or SAE 4 (7/16-20 UNF).

The basic building part, directional control valve RPEK1-03 size 03, enables a control of moving direction and stopping the actuator. The functionality of individual sections can be extended by horizontal and vertical integration of blocks with built-in screw-in cartridge valves. Options include: pressure relief valves, unloading valves, poppet valves, throttle valves for speed control, reducing valves for adjusting and maintaining constant pressure, pilot operated check valves for load position assurance and overcenter valves for motion control of negative acting load.

The blocks and plates are horizontally connected using 3 M6 studs/nuts and vertically connected using 4 M5 studs/bolts.

To attach the block to a base or frame M6 connection threads can be found on the underside of the inlet blocks and plates. It is possible to use steel mounting angles fixed to the face by two studs.

### Technical Data

Nominal size		size 03
Max. pressure	bar (PSI)	250 (3630)
Max. flow channel P, T	l/min (GPM)	60 (15.9)
Max. flow 1 section directional control valve	l/min (GPM)	20 (5.3)
Max. no. of integrated plates (horizontal)		8 (end inlet), 16 (center inlet)
Fluid temperature (NBR)	°C (°F)	-30 ... +80 (+100) [-22 ... +176 (+212)]
Fluid temperature (FPM)	°C (°F)	-20 ... +80 (+120) [-4 ... +176 (+248)]
Max. ambient temperature	°C (°F)	+50 (+122)
Solenoid control voltage	V DC	12, 24
The fluid value in brackets applies to valves without solenoids		
	Datasheet	Type
General information	GI 0060	Products and operating conditions
Section directional control valve RPEK1-03	HA 4027	Product description and features
Pilot operated check valve VJR5-03/M	HA 5027	Product description and features
Mounting interface	SMT 0019	Size 03, Directional control valve RPEK1-03
Valve chambers	SMT 0019	A2 (C-8-2), A3 (C-8-3), QC2, Q3
Spare parts	SP 8010	

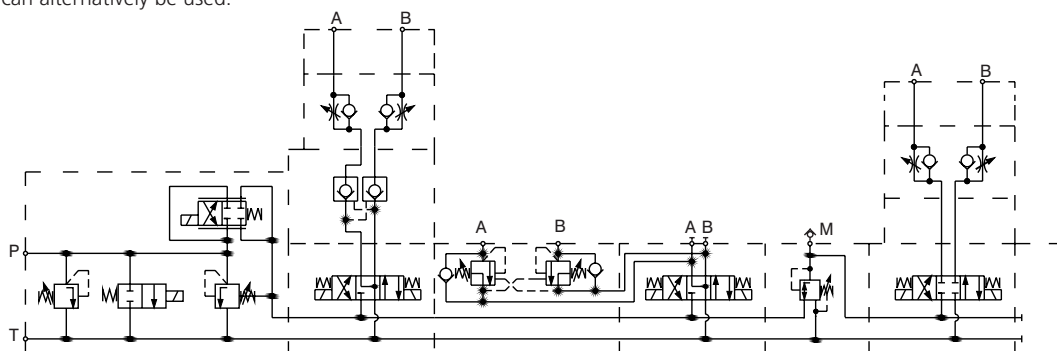
## Content

Content	Page
Example of block kits	2
Sectional directional control valve RPEK1-03 (catalog HA 4027)	3 - 6
Inlet block and plate, end plate	7 - 13
Block with valve for horizontal integration	14 - 19
Block with valve for vertical integration	20 - 26
Pilot operated check valve VJR5-03/M (catalog HA 5027)	21 - 22

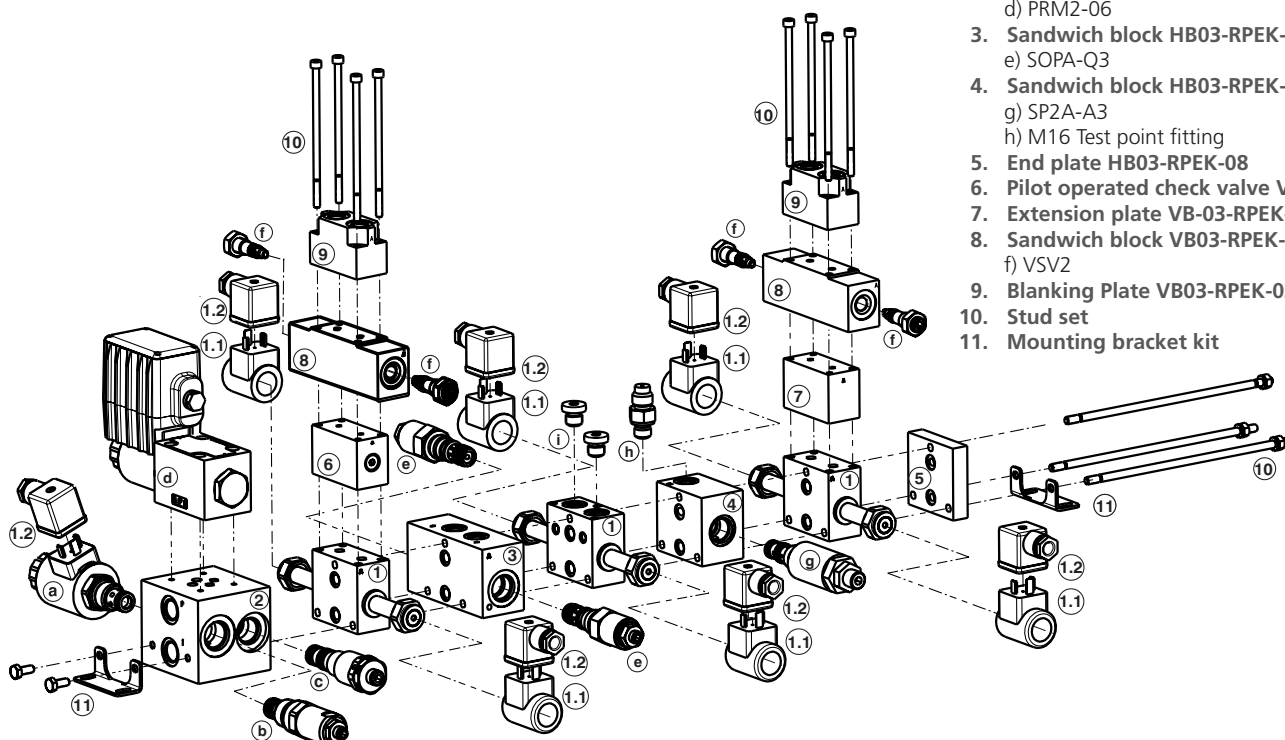
## Example modular block

The modular assembly shown below is connected to the hydraulic circuit via P, T ports in the inlet block HB03-RPEK-MZ (on the left side). The inlet block is provided with four built-in valves. The pressure relief valve protects the entire assembly and connected actuators from pressure overload. The unloading valve allows full flow bypass when actuators are stopped. The single solenoid operated proportional directional control valve enables smooth flow regulation throughout the entire modular assembly. The three-way pressure compensator maintains a constant pressure drop on the control edges of proportional valve and makes the flow regulation independent of the load change. The modular assembly has three circuits (sections) for operation of three actuators, consisting of 5 modular blocks.

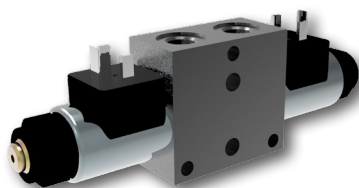
The directional control valve RPEK1-03 is a basic part of each circuit and enables a control of moving direction. In the first circuit two valves are vertical integrated. The pilot operated check valve assures a position of the loaded actuator at disconnected pressure source. The double throttle valve with bypass check valve enables a flow adjusting independently in channels A and B. In the second circuit the horizontally integrated overcenter valve enables safety motion control of a negative acting load. In the third circuit the preconnected pressure reducing valve maintains the constant pressure. The double throttle valve with bypass check valve enables a flow adjusting. The output work ports A, B for connecting to actuators are on the upper surface of the blocks. The modular assembly is closed (on the right side) with end plate HBO-RPEK-08 or RPEK-body RPEK1 0303Z11/Z1 can alternatively be used.



1. RPEK1-03
  - 1.1. Coils
  - 1.2. Electrical connector
- i) Plug G 1/4 (SAE 6)
2. Inlet block HB03-RPEK-MZ
  - a) SD2E-B2
  - b) SR1A-B2
  - c) TV2-063
  - d) PRM2-06
3. Sandwich block HB03-RPEK-MAB1
  - e) SOPA-Q3
4. Sandwich block HB03-RPEK-MP1
  - g) SP2A-A3
  - h) M16 Test point fitting
5. End plate HB03-RPEK-08
6. Pilot operated check valve VJR5-03
7. Extension plate VB-03-RPEK-01
8. Sandwich block VB03-RPEK-MD
  - f) VSV2
9. Blanking Plate VB03-RPEK-02
10. Stud set
11. Mounting bracket kit

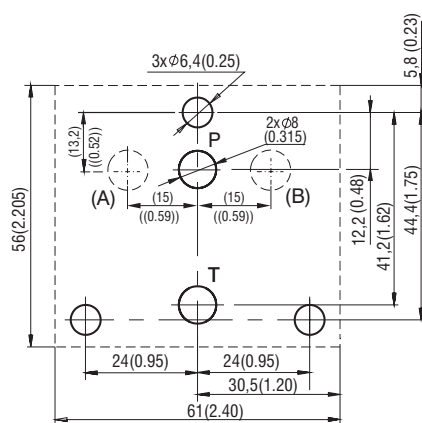


### Technical Features



- › Solenoid Operated Directional Control Valve built into a modular block, intended for horizontal integration
- › Applicable to a pressure of 250 bar and a maximum flow of 20 l/min per section
- › Basic building element for modular assembly RPEK1-03/B
- › Optional blocks are ground on the top surface to enable vertical integration
- › Range of control voltages, solenoid connections and types of emergency hand control
- › Wide range of spools
- › Ideal for smaller build-in space and assembly into control manifold or powerpacks
- › Cost efficient due to high flexibility of construction solutions
- › In the standard version the valve body is phosphated. The steel parts are zinc coated for 240 h corrosion protection in NSS acc. to ISO 9227. Optional increased surface corrosion protection of the whole valve 520 h in NSS, e.g. for mobile applications.

### Technical Data

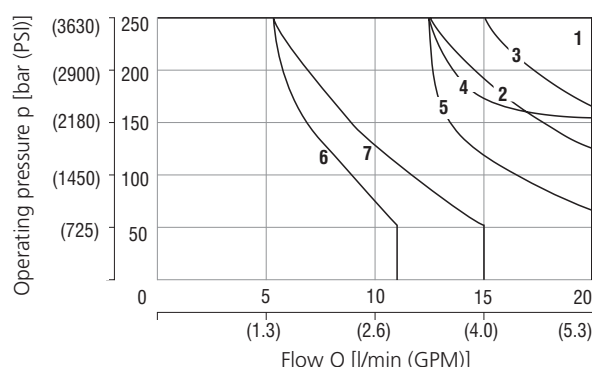


Valve size		03
Max. flow (single section)	l/min (GPM)	20 (5.3)
Max. operating pressure at port P, A, B	bar (PSI)	250 (3630)
Max. operating pressure at port T	bar (PSI)	210 (3050)
Fluid temperature range (NBR)	°C (°F)	-30 ... +80 (-22 ... +176)
Fluid temperature range (FPM)	°C (°F)	-20 ... +80 (-4 ... +176)
Ambient temperature range	°C (°F)	-30 ... +50 (-22 ... +122)
Supply voltage tolerance	%	DC: ±10
Max. switching frequency	1/h	15 000
Set time at v=32 mm²/s (156 SUS)	ON	ms 30 ... 50
	OFF	ms 30 ... 50
Weight    - valve with 1 solenoid - valve with 2 solenoids	kg (lbs)	0.90 (1.98) 1.05 (2.32)
Data Sheet		Type
General information	GI_0060	Products and operating conditions
Coil types / connectors	C_8007 / K_8008	C14B*/ K*
Mounting interface	SMT_0019	Size 03
Spare parts	SP_8010	

### Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

#### Operating limits

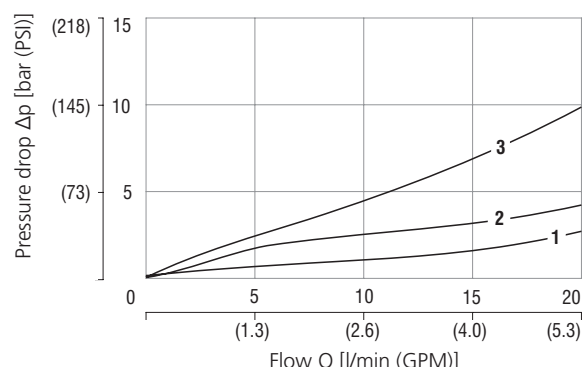
Performance characteristic limits for given temperature range and a supply voltage equal to 90 % of nominal



Spool symbol	
Z11, Z51, R11, P11	1
C11, C51, X11	2
H11, Y11, H51	3
C11, Y11, Y51	4
R21	5
A51, Y82	6
Z81	7

For operating limits under conditions other than shown consult our technical department. Admissible operating limits may be considerably lower with only one direction of flow (A or B plugged or without flow).

#### Pressure drop related to flow rate



Spool symbol	P-A	P-B	A-T	B-T	P-T
Z11, Y11, P11	1	1	1	1	
R11, R21, X11	2	2	2	2	
Y51, Z51		1	1		
C11	3	3	3	3	2
H11, H51	1	1	1	1	2
C51	3			3	2
A51	2	2			
X11	2	2	2	2	
Y82	2	2	1	3	
Z81			1	2	

<b>RPEK1-03</b>		<b>4/2 and 4/3 directional control valve, solenoid operated, bankable</b>	<b>Valve size</b>	<b>Type of connection</b> thread A, B - G 1/4 (BSPP) thread A, B SAE 6 - 9/16-18 UNF stackable	<b>Number of valve positions</b> two positions three positions	<b>Spool symbols</b> see the table of "Spool Symbols"	<b>Rated supply voltage of solenoids (at the coil terminal)</b> 12 V DC / 1.83 A 24 V DC / 0.92 A	<b>Connector</b> EN 175301-803-A E1 with quenching diode AMP Junior Timer - axial direction (2 pins; male) E3A with quenching diode Deutsch DT04-2P - axial direction (2 pins; male) E12A with quenching diode E13A	<b>Surface treatment</b> standard A zinc-coated (ZnCr-3), ISO 9227 (240 h) B zinc-coated (ZnNi), ISO 9227 (520 h)	<b>Seals</b> NBR FPM (Viton)	<b>Model</b> standard, P, T through ports <b>P1</b> P, T through ports, A1, B1 side ports seal recess <b>P2</b> P, T through ports, A1, B1 side ports inverted (flat face) <b>Z1</b> end valve, one side P, T seal recess <b>Z2</b> end valve, one side P, T ports inverted (flat face) <b>Z3</b> end valve, one side P, T ports, A1, B1 side ports, all ports seal recess <b>Z4</b> end valve, one side P, T, A1, B1 side ports inverted, all ports flat face	<b>Manual override</b> standard <b>N2</b> protected with rubber boot <b>N5</b> socket head screw
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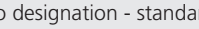
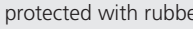
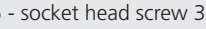
## Spool Symbols

Type	Symbol	Interposition	Type	Symbol	Interposition	Type	Symbol	Interposition
Z11			R11			H51		
C11			R21			Z51		
H11			A51			Z11		
P11			Y51			X11		
Y11			C51			C11		
Y82			Z81			Y11		

## Solenoid Coil in millimeters (inches)

E1, E2 - Protection degree IP65	E3A, E4A - Protection degree IP67	E12A, E13A - Protection degree IP67 / IP69	
			<p>The indicated IP protection level is only reached with a properly mounted connector.</p>

## Manual Override in millimeters (inches)

No designation - standard	N2- protected with rubber boot	N5 - socket head screw 3	
			<p>In case of solenoid malfunction or power failure, the spool of the valve can be shifted by manual override as long as the pressure in port T does not exceed 25 bar (363 PSI). For alternative manual overrides contact our technical support.</p>

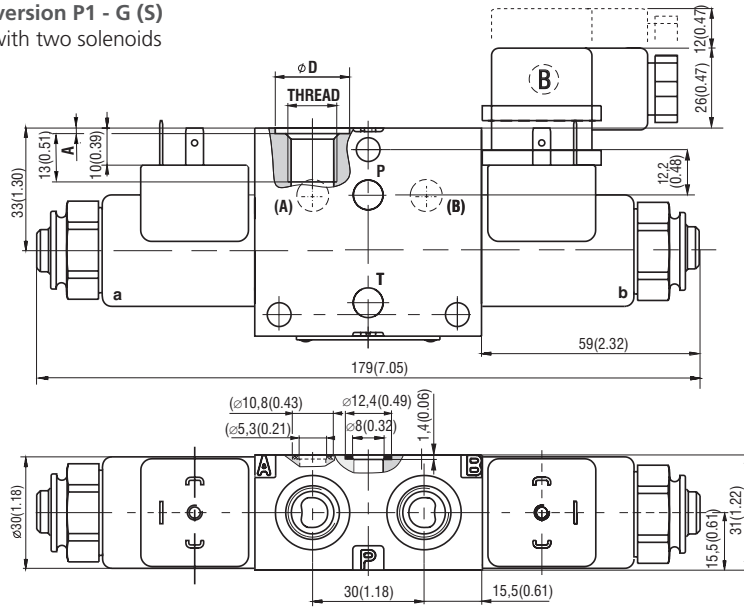
Dimensions of RPEK1-03 in millimeters (inches)

	Bankable block with threaded work ports	Bankable block for vertical circuit integration	Example of threaded work port type blocks for horizontal integration	Functional description
Standard				Standard bankable block.
P1 - G (S)				Horizontal circuit integration block. Use when additional functionality for work ports is desired. Integration work ports are seal recess type.
P2 - G (S)				Horizontal circuit integration block. Use when additional functionality for work ports is desired. Integration work ports are flat face type.
Z1 - G (S)				End valve block - seal recess type.
Z2 - G (S)				End valve block - flat face type.
Z3 - G (S)				End valve horizontal circuit integration block - seal recess type. Use when additional functionality for work ports is desired.
Z4 - G (S)				End valve horizontal circuit integration block - flat face type. Use when additional functionality for work ports is desired.

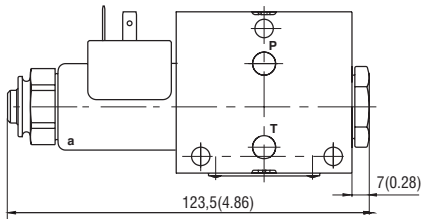
**Dimensions** in millimeters (inches)

**Body version P1 - G (S)**

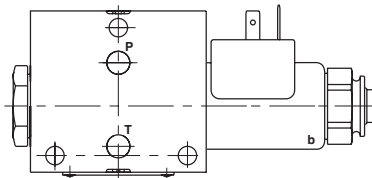
Valve with two solenoids



**Valve with one solenoid „a”**

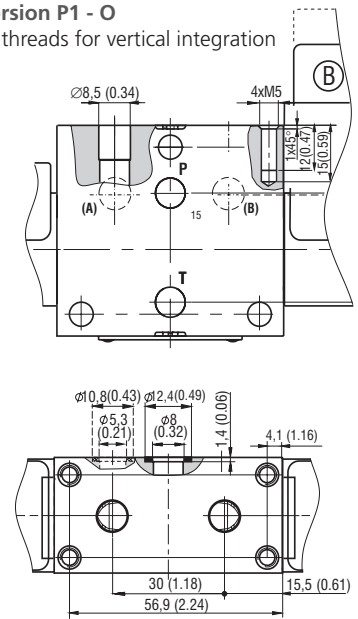


**Valve with one solenoid „b”**



**Body version P1 - O**

Without threads for vertical integration



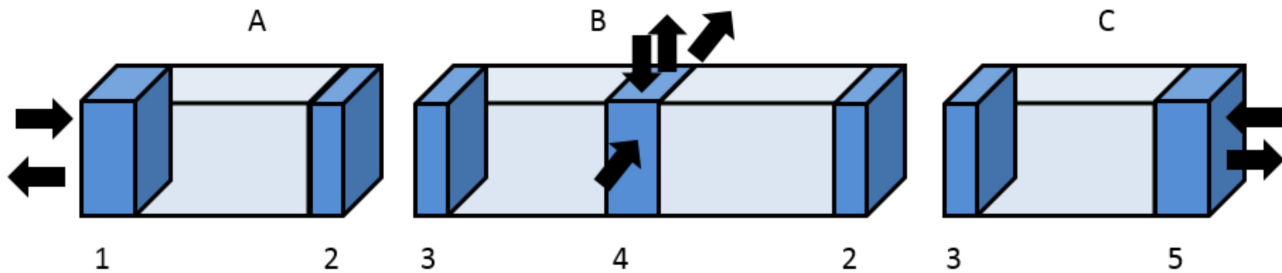
	G	S
THREAD	G 1/4	SAE 6-9/16-18UNF
Ø D [mm]	20.9 H13	25+0.5
Ø D [in]	0.823	0.984+0.02
A [mm (in)]	1 (0.039)	0.5 (0.020)



## Inlet blocks, plates and end cover plates

Inlet block has P,T ports with connecting threads to connect the modular block to the pressure and return branches of the hydraulic circuit. In addition, valves can be integrated to the inlet block that together control the hydraulic parameters of the whole circuit.

Modular blocks can be connected to the hydraulic circuit (P,T) on the left, right or in the middle.



A – Modular block pressurized from the left by a block with valves or a plate with P,T inputs on the face. The right side of the block is closed by the end plate or, alternatively by the housing of the directional control valve.

B – Modular block pressurized from the centre plate with inputs P,T on the upper surface or sides. Both ends of the block are closed using end plates or, alternatively by the housing of the directional control valve.

C – Modular block pressurized from the right by a plate with inputs P,T on the face. The left side is closed by and end plate or by the housing of the directional control valve.

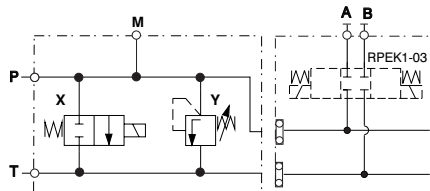
### Overview of types of inlet block, inlet plate and end plate

Position	Type	Order No.	Description
1	HB03-RPEK-MPT	28566200	Inlet block with pressure relief and unloading valves (G 3/8)
1	HB03-RPEK-MPT-S	29342200	Inlet block with pressure relief and unloading valves (SAE 8)
1	HB03-RPEK-MPT1	28813600	Inlet block with pressure relief valve (G 3/8)
1	HB03-RPEK-MPT1-S	29342300	Inlet block with pressure relief valve (SAE 8)
1	HB03-RPEK-MPT2	29401100	Inlet block with pressure pressure relief and unloading valves (G 1/2)
1	HB03-RPEK-MZ	28566300	Inlet block with proportional directional control valve, pressure relief and unloading valves (G 3/8)
1	HB03-RPEK-MZ-S	29342400	Inlet block with proportional directional control valve, pressure relief and unloading valves (SAE 8)
1	HB03-RPEK-06	28566800	Inlet plate - flat face type (G 3/8)
1	HB03-RPEK-06-S	29343300	Inlet plate - flat face type (SAE 8)
2	HB03-RPEK-08	28660300	End plate seal recess type
3	HB03-RPEK-05	16786901	End plate flat face type
4	HB03-RPEK-01	28659800	Center inlet plate with P,T connections on the sides (G 3/8)
4	HB03-RPEK-01-S	29344600	Center inlet plate with P,T connections on the sides (SAE 8)
4	HB03-RPEK-02	28659900	Center inlet plate with P,T connections on the upper surface (G 3/8)
4	HB03-RPEK-02-S	29344700	Center inlet plate with P,T connections on the upper surface (SAE 8)
4	HB03-RPEK-03	28660000	Center inlet plate with P,T connections on the sides (G 3/8)
4	HB03-RPEK-03-S	29344800	Center inlet plate with P,T connections on the sides (SAE 8)
4	HB03-RPEK-04	28660100	Center inlet plate with P,T connections on the upper surface (G 3/8)
4	HB03-RPEK-04-S	29344900	Center inlet plate with P,T connections on the upper surface (SAE 8)
5	HB03-RPEK-07	28660200	Inlet plate - seal recess type (G 3/8)
5	HB03-RPEK-07-S	29345000	Inlet plate - seal recess type (SAE 8)

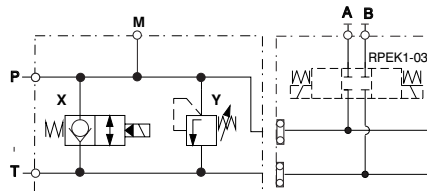
- S denotes the SAE thread

### Inlet block HB03-RPEK-MPT (-S), HB03-RPEK-MPT2

Inlet block with two built-in valves. The pressure relief valve protects the modular block and connected actuators against pressure overloading. Two way unloaded valve connects the input (P) to the output (T) if the consumption of actuators falls to zero. The valve can be optionally replaced by a poppet valve. The valve ports are identical and the valves can be interchanged. Input P,T ports with G 3/8 (SAE 8) threads are on the left side. MPT2 block is distinguished by larger connection threads (G 1/2).



Inlet block with pressure relief valve and 2-way pressure unloading valve

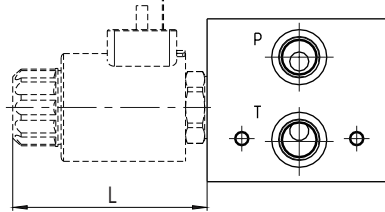


Inlet block with pressure relief valve and poppet type unloading valve

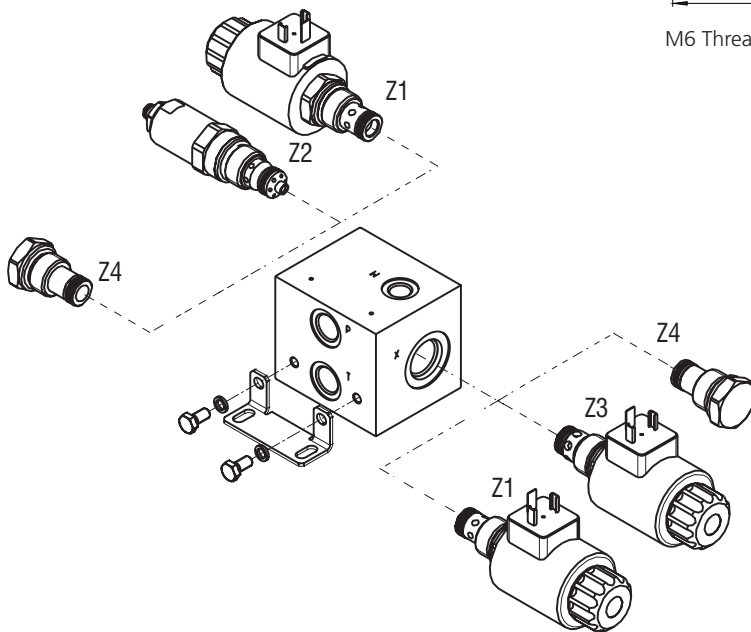
X = Z1, Z3, Z4  
Y = Z1, Z2, Z4

Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Inlet plate	HB03-RPEK-MPT	-	0.813 (1.79)		28566200
	Inlet plate	HB03-RPEK-MPT-S	-	0.813 (1.79)		29342200
	Inlet plate	HB03-RPEK-MPT2	-	0.934 (2.06)		29401100
Z1	Directional valve (spool)	SD2E-B2	82 (3.23)		HA 4060	
Z2	Pressure relief valve	SR1A-B2	65 (2.56)		HA 5064	
Z3	Poppet valve	SD3E-B2	82 (3.23)		HA 4063	
Z4	Plug 7/8-14 UNF	SCP-B2/XX-A	10 (0.39)		HA 0050	19356300

Type	MPT	MPT-S	MPT2
Input ports P, T	G 3/8	SAE 8	G 1/2
Gauge port M	G 1/4	SAE 4	G 1/4
Valve cavity	7/8-14 UNF (B2, C-10-2)		

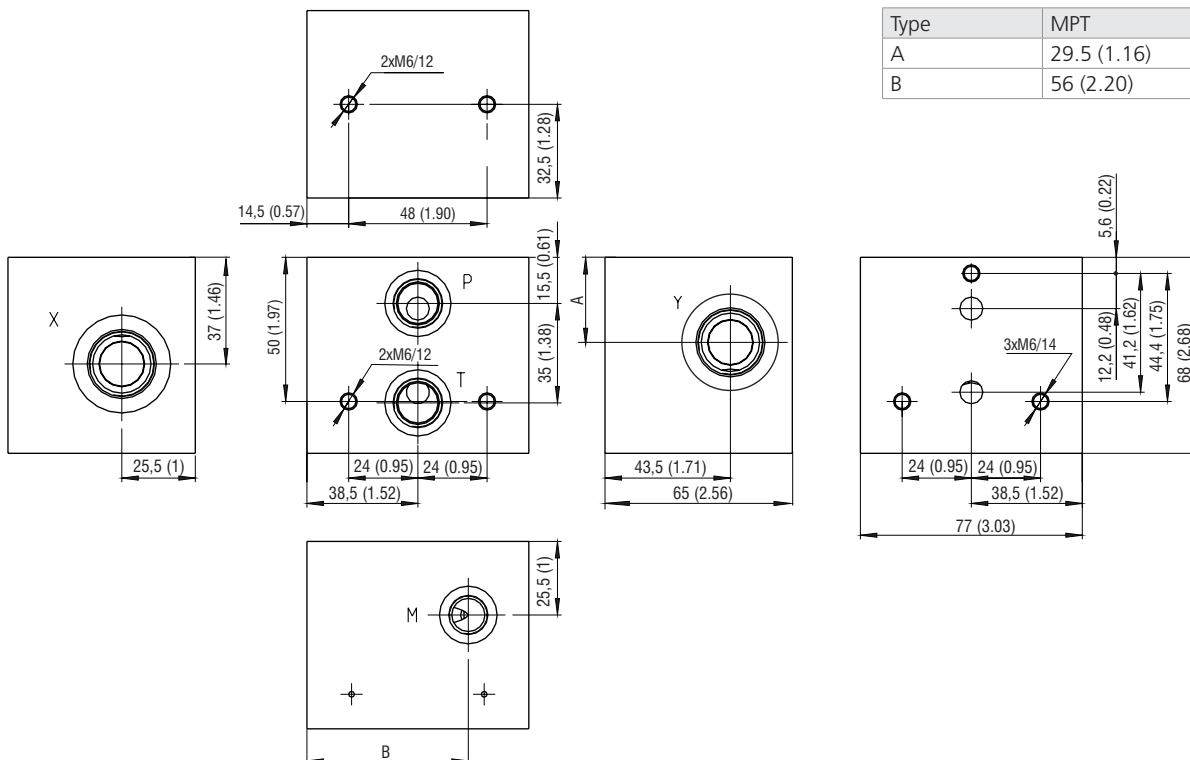


M6 Threaded chambers are standard to fit the block to the plate / frame



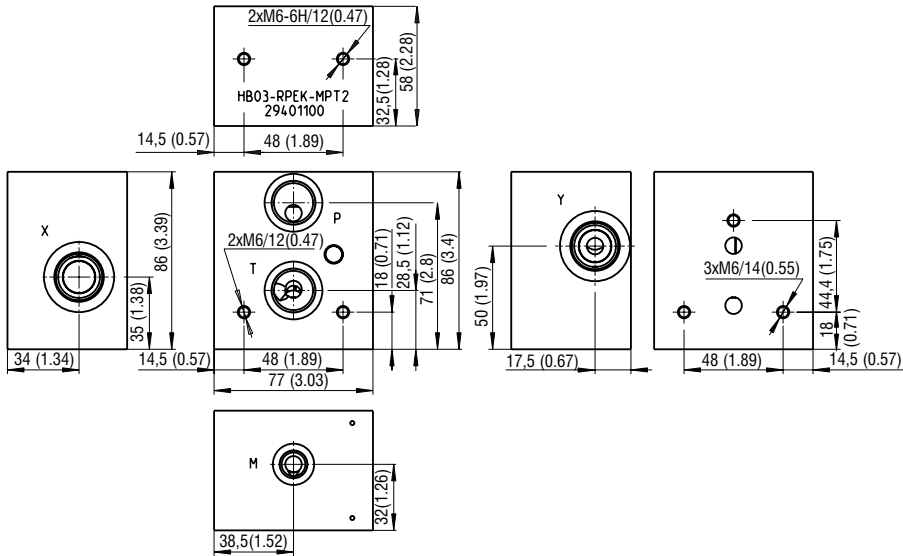
#### Block dimensions HB03-RPEK-MPT (-S) in millimeters (inches)

Type	MPT	MPT-S
A	29.5 (1.16)	31 (1.22)
B	56 (2.20)	54 (2.13)



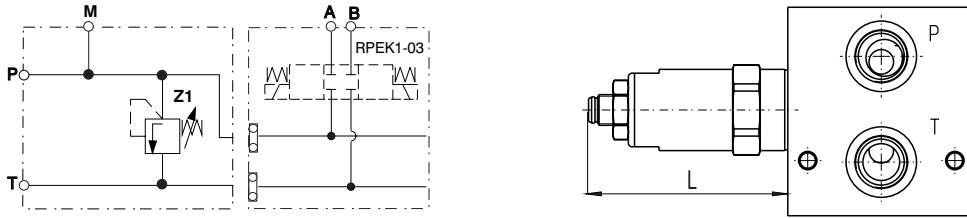


### Block dimensions HB03-RPEK-MPT2 in millimeters (inches)



### Inlet block HB03-RPEK-MPT1 (-S)

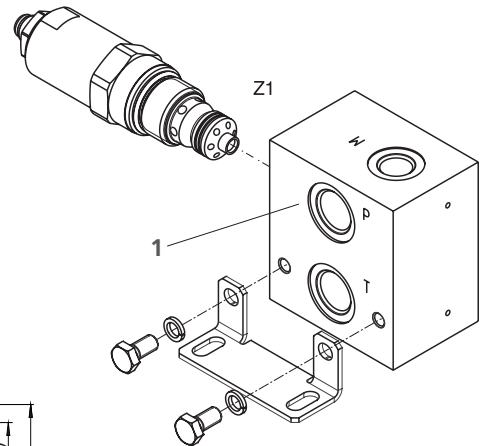
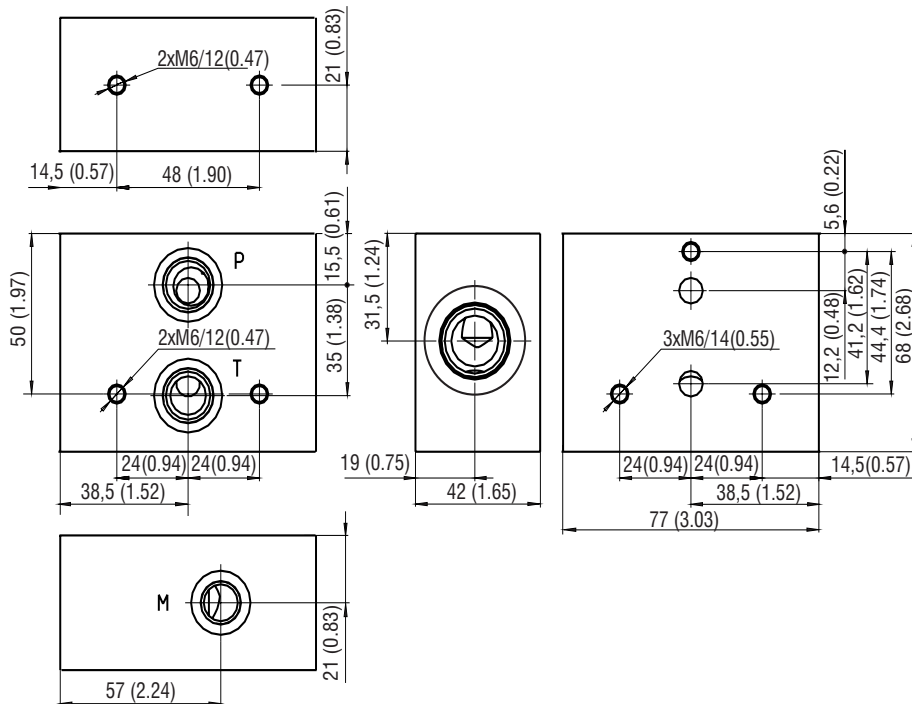
Inlet block with built-in pressure relief valve which, protects the block and the connected actuator against pressure overload.



Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Inlet plate	HB03-RPEK-MPT1	-	0.407 (0.90)		28813600
	Inlet plate	HB03-RPEK-MPT1-S	-	0.407 (0.90)		29342300
Z1	Pressure relief valve	SR1A-B2	65 (2.56)		HA 5064	

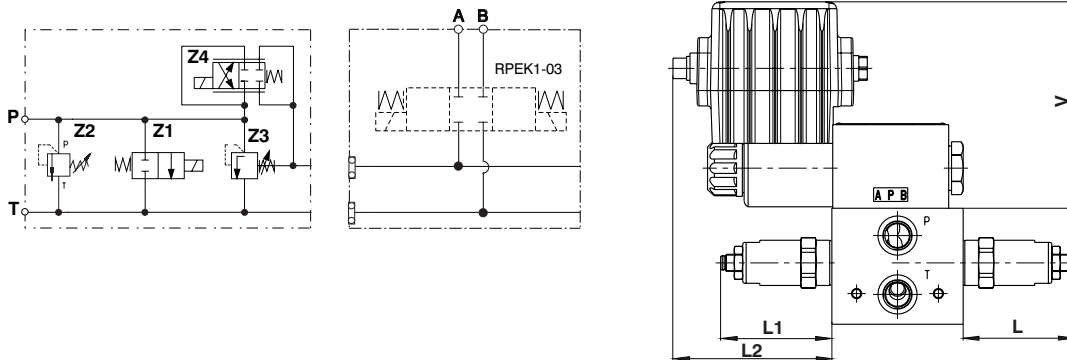
Type	MPT1	MPT-S
Input ports P, T	G 3/8	SAE 8
Gauge port M	G 1/4	SAE 4
Valve cavity	7/8-14 UNF (B2, C-10-2)	

**Block dimensions HB03-RPEK-MPT1 (-S) in millimeters (inches)**



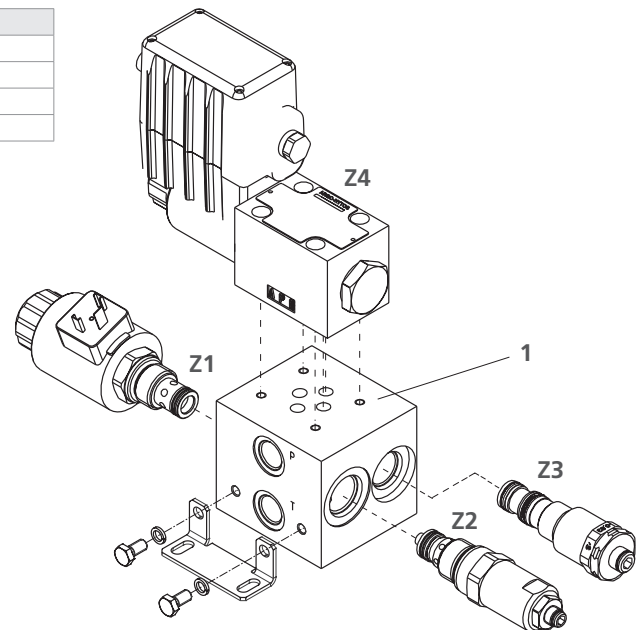
## Inlet block HB03-RPEK-MZ (-S)

Inlet plate with 4 built-in valves. The pressure relief valve (Z2) protects the modular block and connected actuators from overloading. The 2-way unloading valve (Z1) enables connection P→T. The proportional single solenoid directional control valve (Z4) enables smooth flow control from 0 to maximum in all block sections. The 3-way pressure compensator (Z3) assures the flow regulation independent on the change of load.

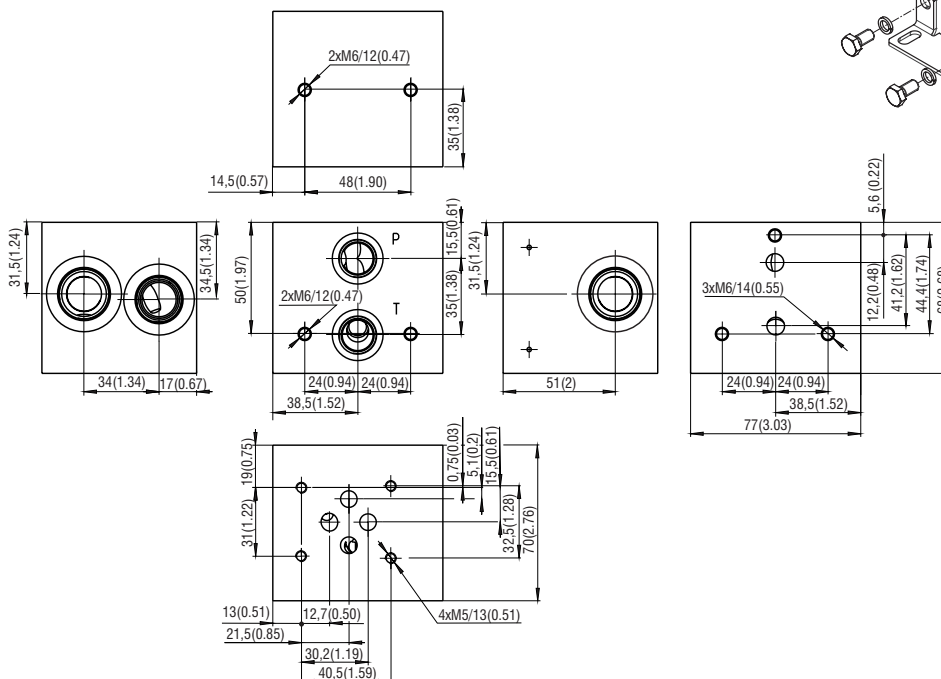


Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Inlet block	HB03-RPEK-MZ	-	0.846 (1.87)		28566300
	Inlet block	HB03-RPEK-MZ-S	-	0.846 (1.87)		29342400
Z1	Directional valve (spool)	SD2E-B2	L1 = 82 (3.23)		HA 4060	
Z2	Pressure relief valve	SR1A-B2	L = 65 (2.56)		HA 5064	
Z3	3-way pressure compensator	TV2-063/S	L = 42 (1.65)		HA 5158	
Z4	Proportional Directional Control Valve	PRM2-062	L2 = 140 (5.51) V = 122 (4.80)		HA 5104	

Type	MZ	MZ-S
Input ports P, T	G 3/8	SAE 8
Cavity for valves SD2E-B2, SR1A-B2	7/8-14 UNF (B2, C-10-2)	
Cavity for valve TV2-063	M20 x 1,5 (QE3)	
Valve mounting interface	ISO 4401-03-02-0-05	



### Block dimensions HB03-RPEK-MZ (-S) in millimeters (inches)

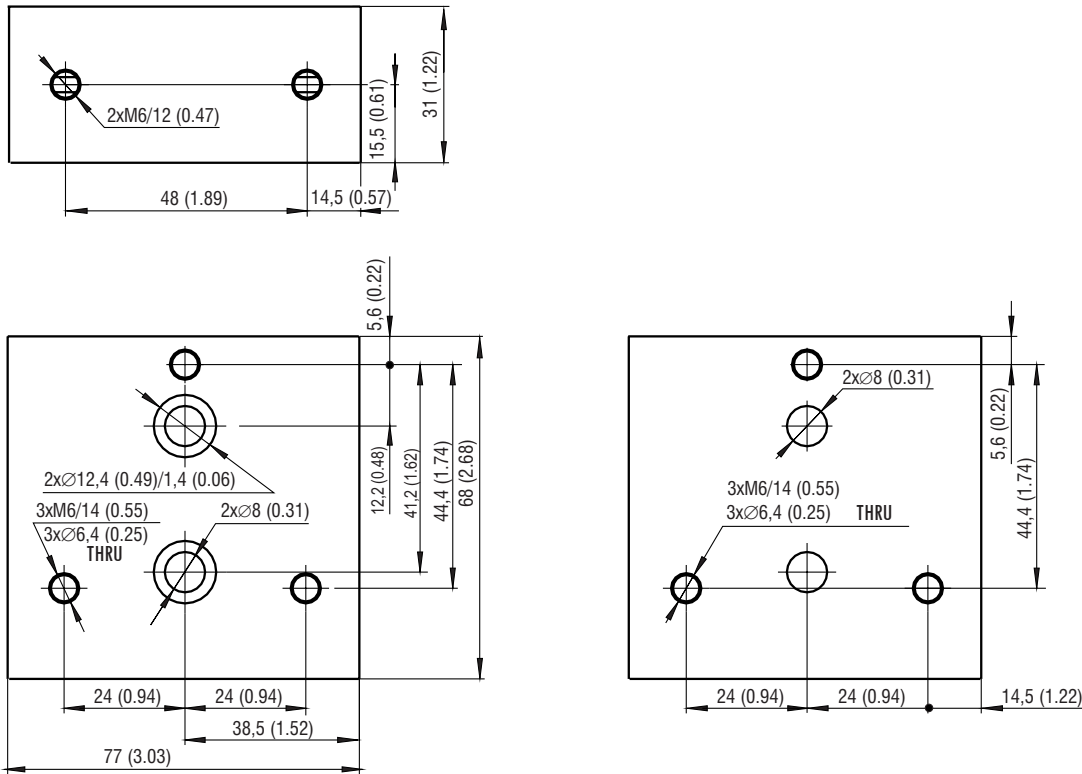


## Center inlet plates HB03-RPEK-01, 02, 03, 04 (-S)

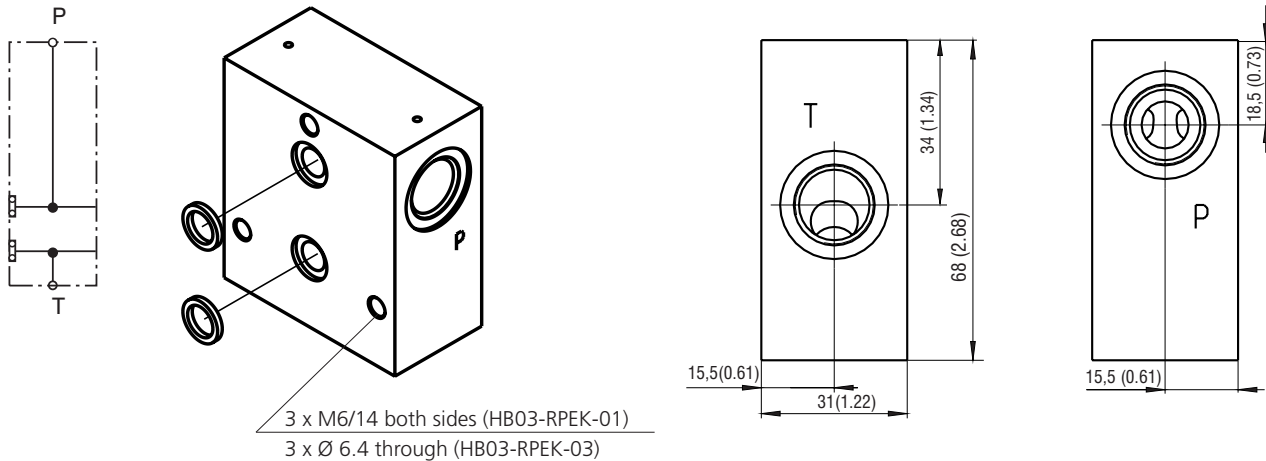
Plate types 01 and 02 are designed for installation between horizontally integrated blocks with valves. Serving not only connection of the modular block to branches P,T of the hydraulic circuit, but also as a support element to screw the bolts (studs) from both sides, thus allowing horizontal integration of the blocks with valves from left to right. This allows a theoretical integration of up to 16 module blocks. Type 03 and 04 plates have only through holes for M6 bolts (studs) and the maximum number of integrated blocks is reduced to 8.

Type 01 and 03 plates have P,T ports on the side surfaces, 02 and 04 plates on the upper surface.

On the underside, all plates have 2 M6/12 threads to attach the modular block to a plate or frame.

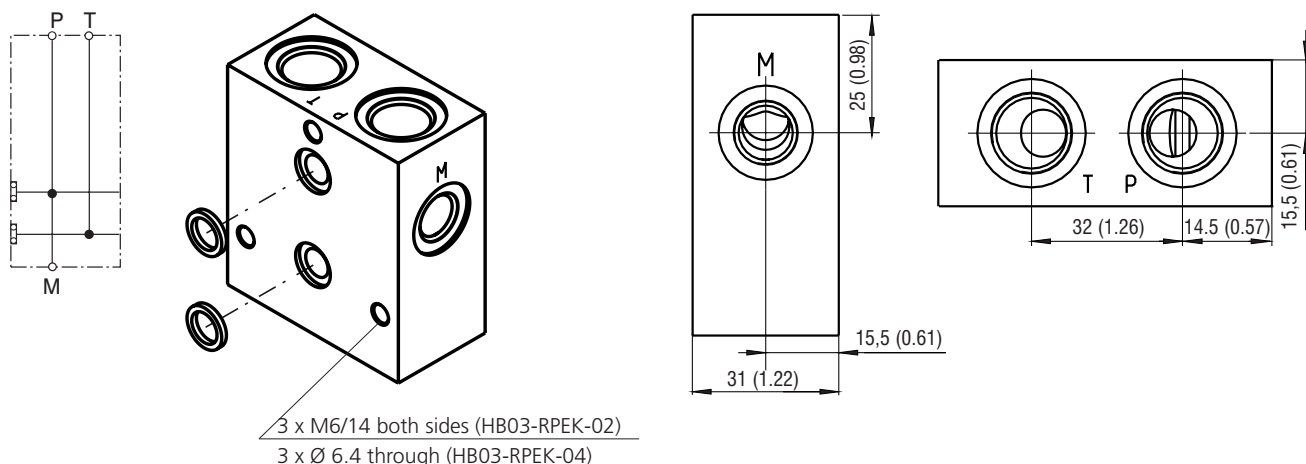


### A. Plates with side ports P, T



Name		Type	Thread P, T	m [kg (lbs)]	Order No.
Plate + seals	Threads for studs	HB03-RPEK-01	G 3/8	0.318 (0.70)	28659800
Plate + seals	Threads for studs	HB03-RPEK-01-S	SAE 8	0.318 (0.70)	29344600
Plate + seals	Cavity for studs	HB03-RPEK-03	G 3/8	0.315 (0.69)	28660000
Plate + seals	Cavity for studs	HB03-RPEK-03-S	SAE 8	0.315 (0.69)	29344800

## B. Plate with P,T ports on the upper surface and gauge side port M



Name		Type	Thread P, T	závit M	m [kg (lbs)]	Order No.
Plate + seals	Threads for studs	HB03-RPEK-02	G 3/8	G 1/4	0.318 (0.70)	28659900
Plate + seals	Threads for studs	HB03-RPEK-02-S	SAE 8	SAE 4	0.318 (0.70)	29344700
Plate + seals	Cavity for studs	HB03-RPEK-04	G 3/8	G 1/4	0.315 (0.69)	28666010
Plate + seals	Cavity for studs	HB03-RPEK-04-S	SAE 8	SAE 4	0.315 (0.69)	29344900

### Inlet plates HB03-RPEK-06, 07 (-S) and end plates HB03-RPEK-05, 08

Inlet plates type 06, 07 replace inlet blocks. Serving only to connect the modular block to P,T branches of the hydraulic circuit. The orifices for bolts/studs are straight through.

The type 06 plate is designed for installation on the left side of the modular block (output on the left, right side honed without recess for sealing).

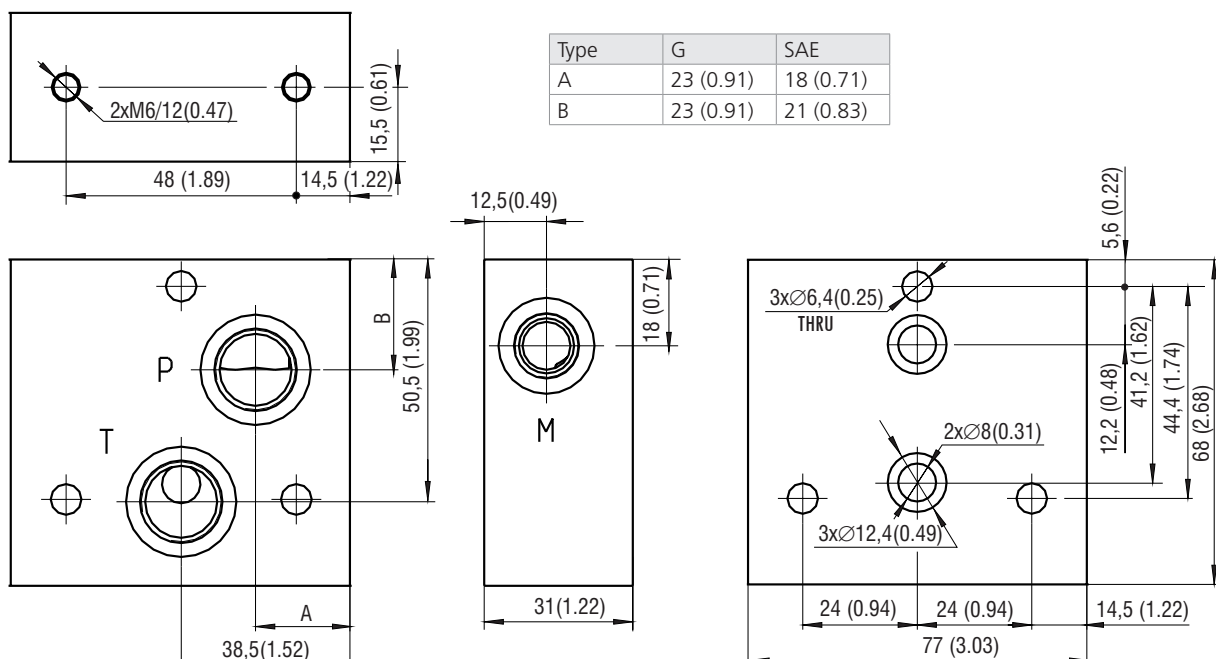
The type 07 plate is designed for installation on the right side of the modular block (output on the right, left side with recess for sealing).

End plates types 05 and 08 are installed in combination with inlet plates or blocks and close the horizontally integrated module block on the opposite side.

The type 05 plate is designed for installation on the left side of the modular block (right side honed without recess for sealing).

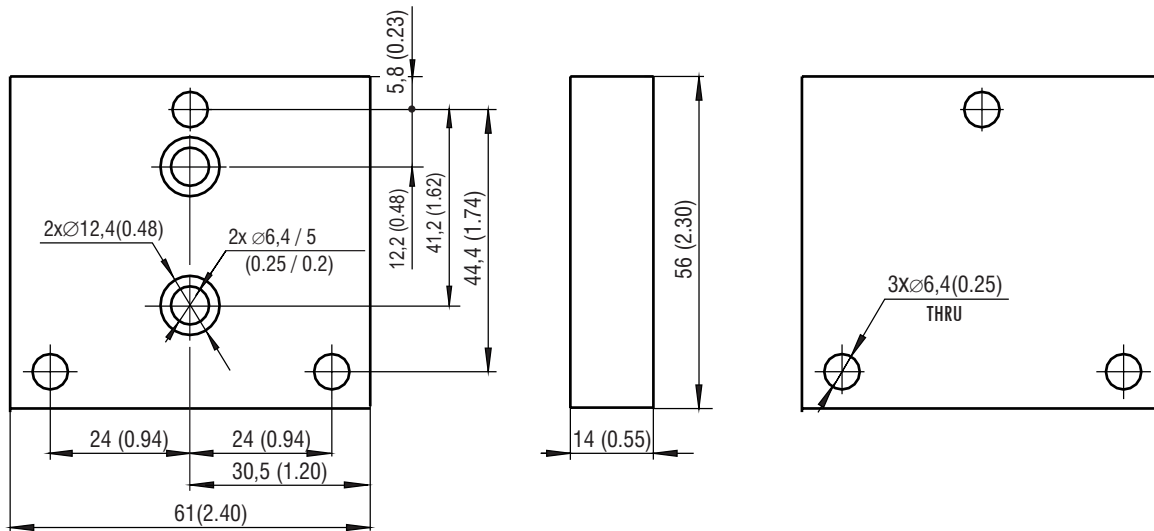
The type 08 plate is designed for installation on the right side of the modular block (left side with recess for sealing). The plate can be replaced by the body of the RPEK1-03 type Z1 or Z3 (with one-sided inputs).

### Inlet plate dimensions HB03-RPEK-06, 07 (-S) in millimeters (inches)



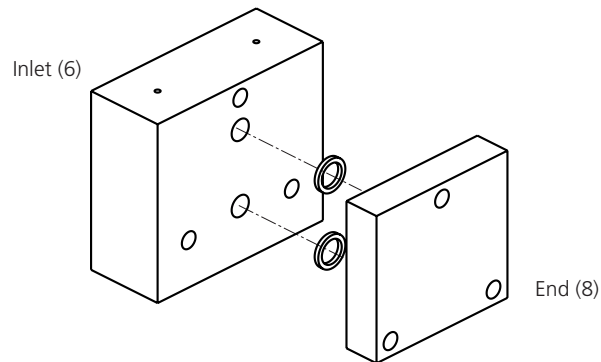
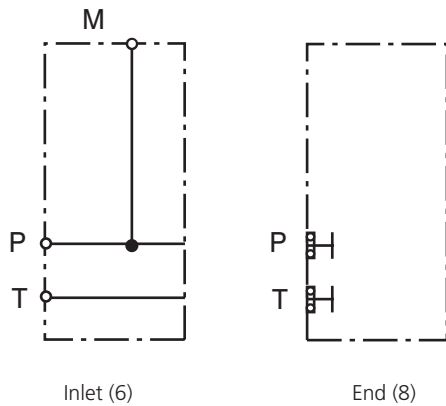
Recess 3 x Ø12.4 only at Inlet plate type HB03-RPEK-07

End plate dimensions HB03-RPEK-05, 08 in millimeters (inches)



Recess 3 x Ø12.4 only at end plate type HB03-RPEK-08

## A. Plates for left side inlet configuration

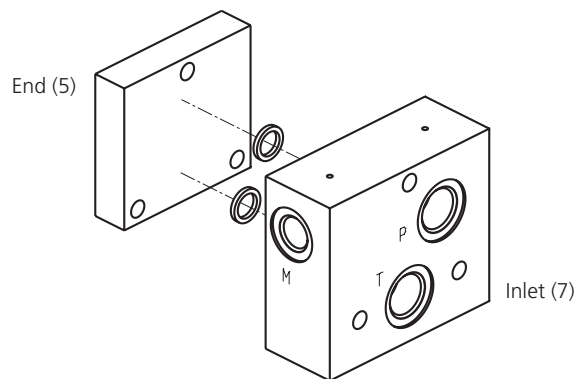
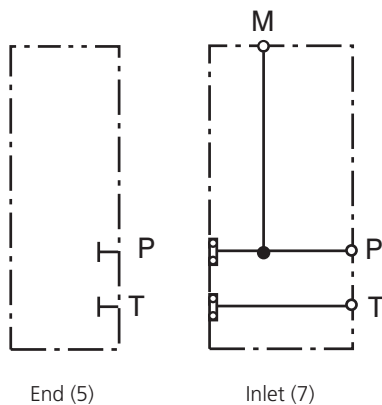


Inlet plate  
HB03-RPEK-06 (-S)

End plate HB03-RPEK-08 or body of  
modular valve RPEK1-03xxx /xZ1 (Z2)xx

Name	Position	Type	Thread P, T	Thread M	m [kg (lbs)]	Order No.
Inlet plate left	6	HB03-RPEK-06	G 3/8	G 1/4	0.315 (0.69)	28566800
Inlet plate left	6	HB03-RPEK-06-S	SAE 8	SAE 4	0.315 (0.69)	29343300
End plate right	8	HB03-RPEK-08	-	-	0.135 (0.30)	28660300

## B. Plates for right side inlet configuration



End plate  
HB03-RPEK-05

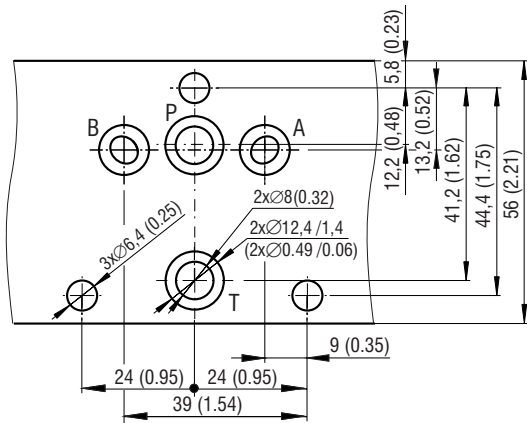
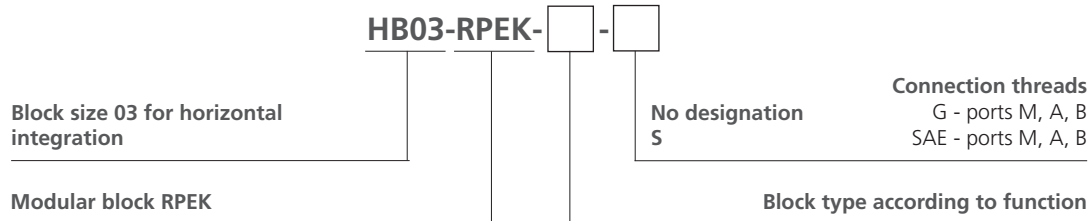
Inlet plate  
HB03-RPEK-07 (-S)

Name	Position	Type	Thread P, T	Thread M	m [kg (lbs)]	Order No.
End plate left	5	HB03-RPEK-05	-	-	0.130 (0.29)	16786901
Inlet plate right	7	HB03-RPEK-07	G 3/8	G 1/4	0.314 (0.69)	28660200
Inlet plate right	7	HB03-RPEK-07-S	SAE 8	SAE 4	0.314 (0.69)	29345000

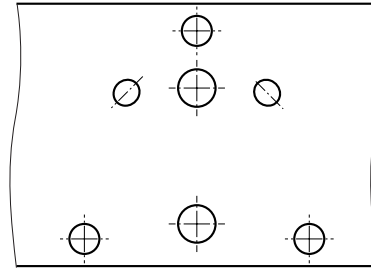
## HBO – modular blocks for horizontal integration

Blocks for built-in valves are produced from aluminium alloy and are horizontally connected by 3 bolts/studs. On the left-hand side P,T ports are provided with a seal recess, on the other (right) side the surface is honed to a flat face.

### Ordering Code



→ Basic mounting interface – left side of the block



Right side of the block

#### Note:

Ports A, B are only suitable for certain blocks.

Blocks with in-built valves have a uniform width of 40 mm (1.58 in) and a height of 56 mm (2.21 in). The third dimension varies according to the built-in valve type.

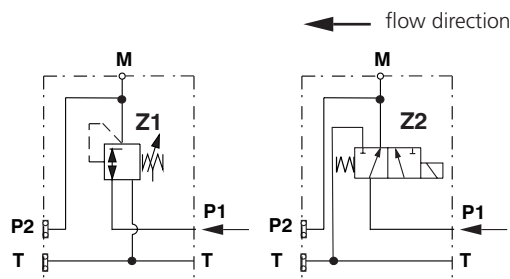
### Overview of HB03 modular blocks for horizontal integration:

Type	Order No.	Description
HB03-RPEK-MP1	28658500	Block for reducing valve or unloading 3- way valve 3/2. Input (P1) Right.
HB03-RPEK-MP1-S	29344000	
HB03-RPEK-MP2	28658900	Block for reducing valve or unloading valve 3/2. Input (P1) Left.
HB03-RPEK-MP2-S	29344100	
HB03-RPEK-MC	28659200	Block with 2 pressure crossport relief valves A ↔ B (A ↔ B).
HB03-RPEK-MD	28659400	Block with two independent pressure relief (A → T, B → T) / unloading valves
HB03-RPEK-MAB	28659700	Block with spool / poppet stop valves in A and B channels
HB03-RPEK-MAB-S	29344200	
HB03-RPEK-MAB1	28650700	Block with overcenter / pilot operated check valves in A and B channels
HB03-RPEK-MAB1-S	29344500	
HB03-RPEK-MAB2	29397800	Block with throttle / stop valves in A and B channels

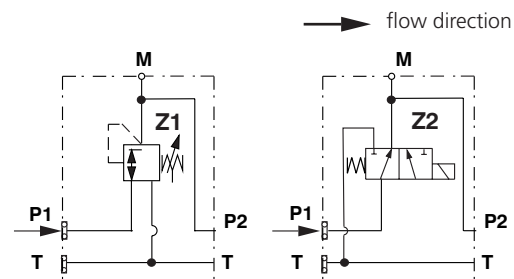
- S marking designates SAE 6 work ports and SAE 4 gauge port, no designator indicates G 1/4 work and gauge ports.

### Block HB03-RPEK-MP1 (-S), MP2 (-S) with reducing/relieving valve or 3-way unloading valve

The MP block is primarily designed for installation of a reducing valve, which provides a constant set pressure on the outlet section (P2), independent of changes in input pressure (P1). The MP1 block has input (P1) from the right, the MP2 block from the left. Alternatively, a 3-way directional control valve 3/2 can be built-in as a unloading valve (P1 → P2 / P1 → T).



Blok HB03-RPEK-MP1

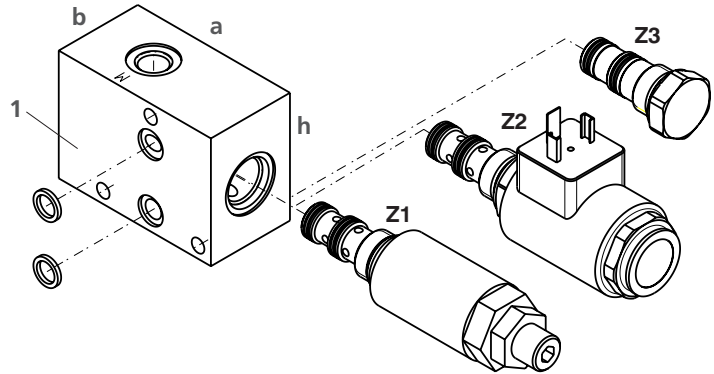
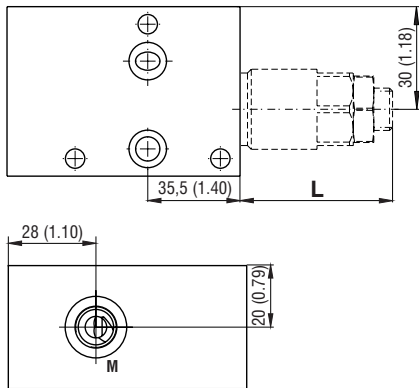


Blok HB03-RPEK-MP2



Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block with seal and thread G 1/4	HB03-RPEK-MP1	-	0.325 (0.72)		28658500
		HB03-RPEK-MP2	-	0.325 (0.72)		28658900
1	Block with seal and thread SAE 4	HB03-RPEK-MP1-S	-	0.325 (0.72)		29344000
		HB03-RPEK-MP2-S	-	0.325 (0.72)		29344100
Z1	Pressure reducing valve	SP2A-A3	77 (3.03)		HA 5143	
Z2	Spool type directional valve	SD2E-A3	70 (2.76)		HA 4041	
Z3	Cavity plug 3/4-16 UNF (closed)	SCP-A3/XXX-A	5 (0.20)		HA 0050	22751900

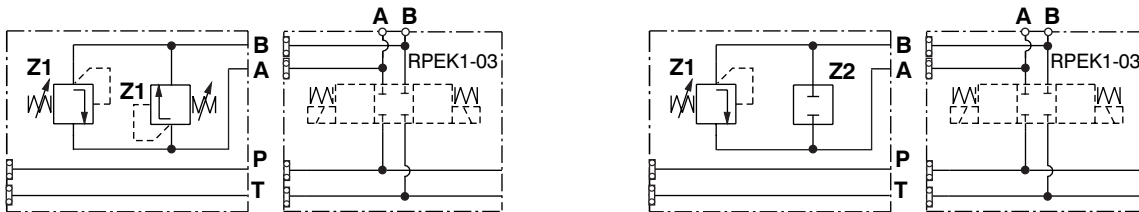
Block dimensions [mm]	77 x 40 x 56 (a x b x h) (3.03 x 1.58 x 2.21)
Valve cavity	3/4-16 UNF (A3, C-8-3)
Gauge port M	G 1/4 (SAE 4)



### Block HB03-RPEK-MC with pressure crossport relief valves

The MC block is designed for the installation of pressure relief valves mutually ensuring channels (A, B) of the actuator against pressure overload (A → B, B → A). Channel A, B inputs from the right.

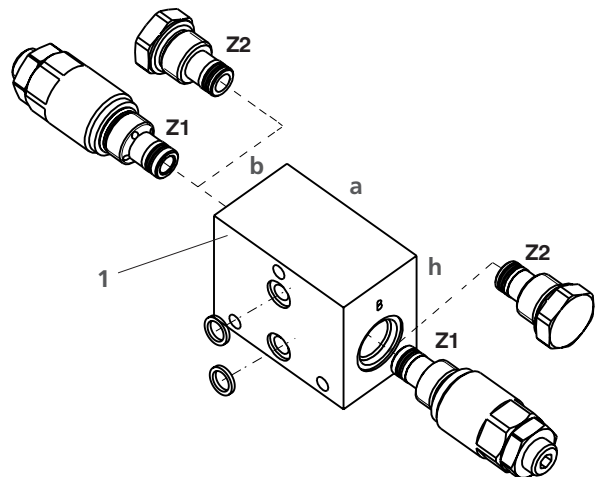
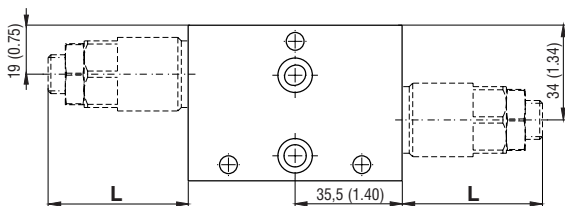
#### Connection A-B, B-A



Block with sectional directional control valve version P1, or Z3 if it is an outer section.

Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block with seals	HB03-RPEK-MC	-	0.379 (0.84)		28659200
Z1	Pressure relief valve	SR1A-A2	49.5 (1.95)		HA 5063	
Z2	Cavity plug 3/4-16 UNF (closed)	SCP-A2/XX-A	7.5 (0.30)		HA 0050	15960800

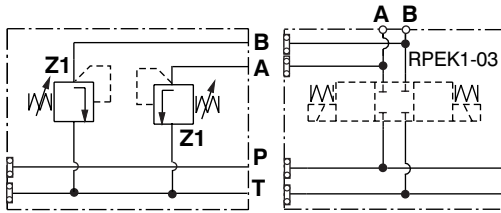
Block dimensions [mm (in)]	77 x 40 x 56 (a x b x h) (3.03 x 1.58 x 2.21)
Valve cavity	3/4-16 UNF (A2, C-8-2)



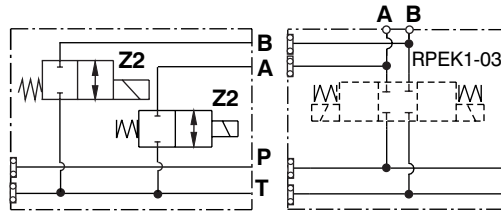
### Block HB03-RPEK-MD with independent A → T and/or B → T relief or unloading

The MD block is designed for a built-in pressure relief valve, assures the actuator channels (A, B) against pressure overload connected T (A → T, B → T). Input channels A, B are on the right. Alternatively, 2-way directional control valves can be built-in acting as independent unloading valves for actuator channels A, B.

#### Connected A-T, B-T



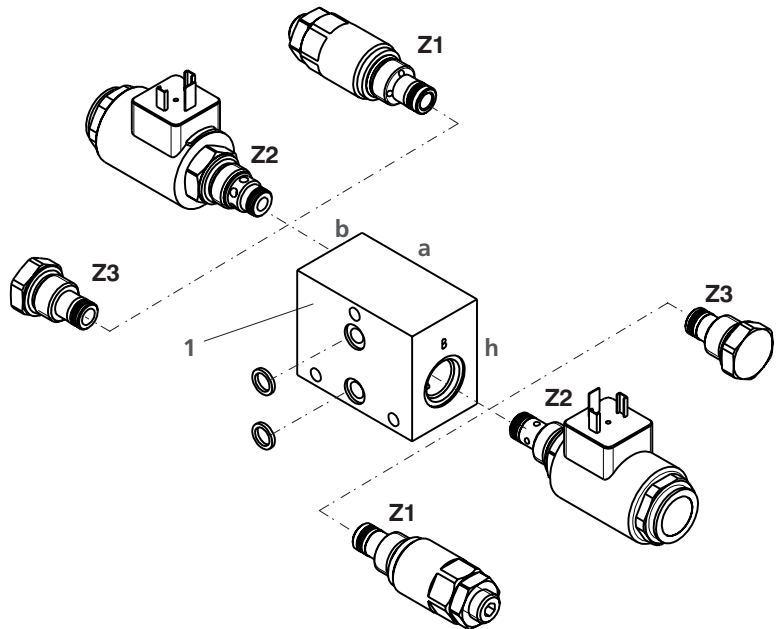
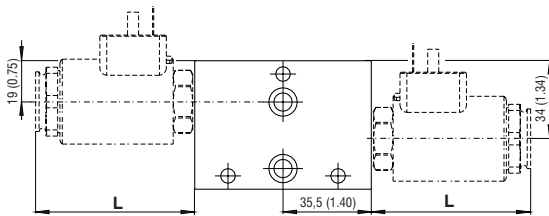
Mutual independent assurance of channels A, B



Relief valve in channels A, B

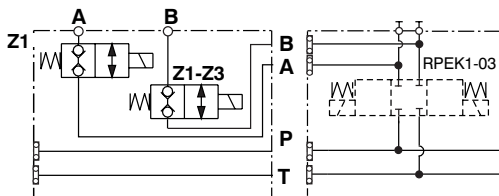
Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block with seals	HB03-RPEK-MD	-	0.378 (0.83)		28659400
Z1	Pressure Relief valve	SR1A-A2	49.5 (1.95)		HA 5063	
Z2	2/2 Spool-type valve	SD2E-A2	70 (2.76)		HA 4040	
Z3	Cavity plug 3/4-16 UNF (closed)	SCP-A2/XX-A	7.5 (0.30)		HA 0050	15960800

Block dimensions [mm (in)]	77 x 40 x 56 (a x b x h) (3.03 x 1.58 x 2.21)
Valve cavity	3/4-16 UNF (A2, C-8-2)

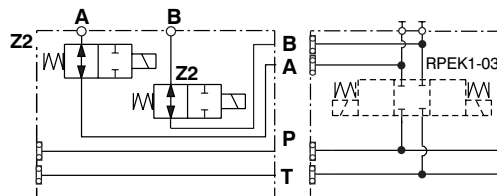


### Block HB03-RPEK-MAB (-S) with independent blocking valves in channels A, B

The MAB block is designed for installation of poppet valves serving to tightly seal channels A,B of the actuator in both directions. Where closing tightness is not an issue, 2-way spool valves may be used. A, B ports from the right.



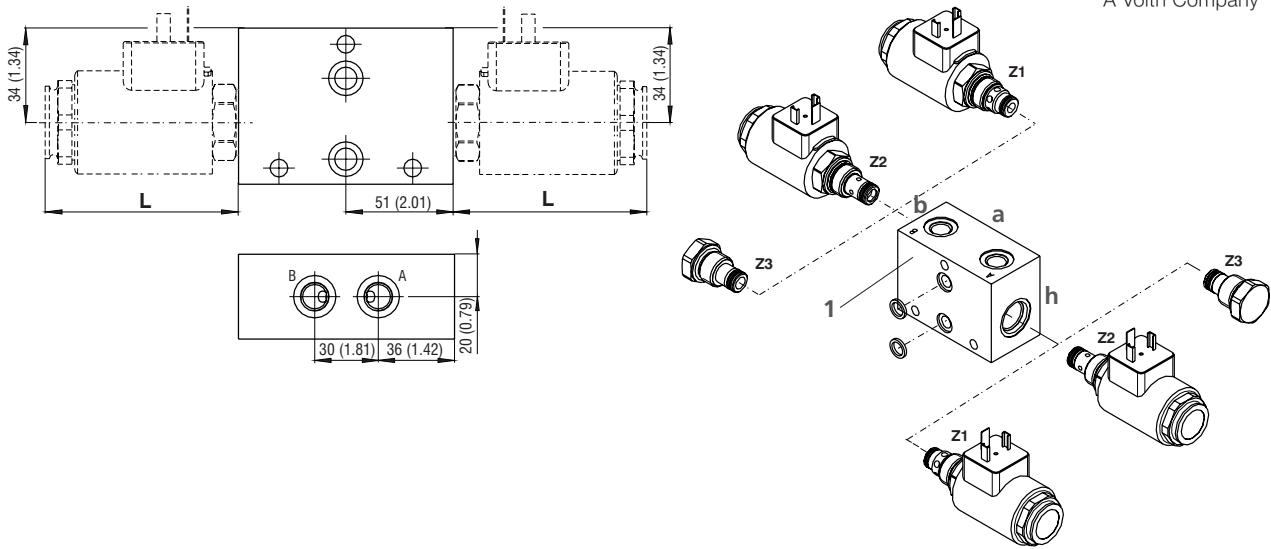
Block with poppet-type blocking valve



Block with 2-way directional control

Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block with seals	HB03-RPEK-MAB	-	0.407 (0.90)		28659700
	Block with seals	HB03-RPEK-MAB-S	-	0.407 (0.90)		29344200
Z1	Poppet-type valve	SD1E-A2	70 (2.76)		HA 4070	
Z2	2/2 Spool-type valve	SD2E-A2	70 (2.76)		HA 4040	
Z3	Cavity plug 3/4-16 UNF (closed)	SCP-A2/XX-A	7.5 (0.30)		HA 0050	15960800

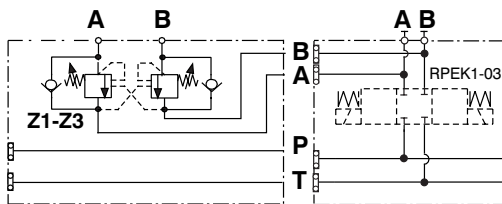
Block dimensions [mm (in)]	102 x 40 x 56 (a x b x h) (4.02 x 1.58 x 2.21)
Valve cavity	3/4-16 UNF (A2, C-8-2)
Output ports A, B	G 1/4 (SAE 6)



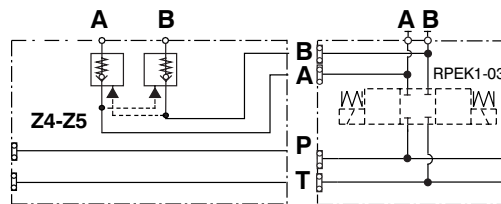
### Block HB03-RPEK-MAB1 (-S) with overcentre or P.O. check valves in channels A, B

MAB1 block with two built-in overcenter valves with bypass check valves is intended for safety control of the moving load, acting in a negative direction. The bypass valves assure a free flow in direction to the actuator.

Alternatively, the overcenter valves can be replaced by pilot to open / closed check valves. A, B ports on the right side.



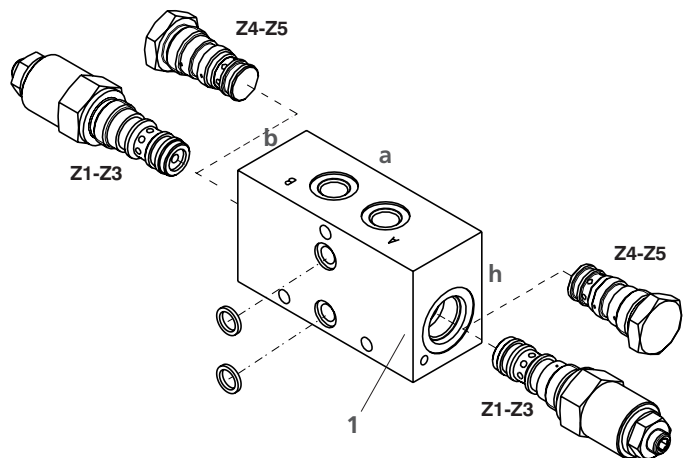
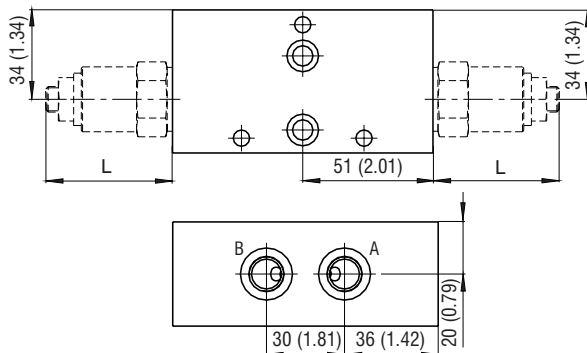
Block with Overcentre Valve



Block with Check Valve

Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block with seals	HB03-RPEK-MAB1	-	0.532 (1.17)		28650700
	Block with seals	HB03-RPEK-MAB1-S	-	0.532 (1.17)		29344500
Z1	Overcentre valve	SO5A-Q3/I	47 (1.85)		HA 5200	
Z2	Overcentre valve	SOP5A-Q3/I	47 (1.85)		HA 5201	
Z3	Overcentre valve	SOB5A-Q3/I	47 (1.85)		HA 5202	
Z4	Pilot to open check valve	SC5H-Q3/I	7 (0.28)		HA 5217	
Z5	Pilot to close check valve	SCC5H-Q3/I	7 (0.28)		HA 5221	

Block dimensions [mm (in)]	102 x 40 x 56 (a x b x h) (4.02 x 1.58 x 2.21)
Valve cavity	M20 x 1,5 (Q3)
Output ports A, B	G 1/4 (SAE 6)



# Block HB03-RPEK-MAB2 with throttle or blocking valves in channels A, B

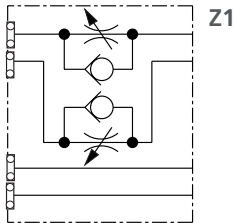
The MAB2 block is designed for the installation of throttle valves with bypass check valves. The valves are used to independently to adjust flow in channels A,B of the actuator. The set flow rate will vary in conjunction with the pressure drop on the valve. If the input channels A,B are on the left, flow is throttled in the direction of the actuator (A → T, B → T).

Alternatively, 2/2 directional control valves or poppet valves are built-in the channels A, B connecting to the actuator.

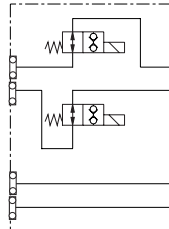
Using the Z4 plug will block flow through either channel A or B. Using the Z5 plug flow remains in the channel.

## Caution:

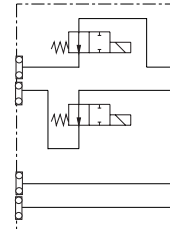
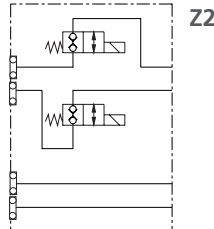
The indirectly-operated poppet valve SD3E-A2 (Datasheet HA 4043) closes the channel only when pressurized fluid is transferred from the right.



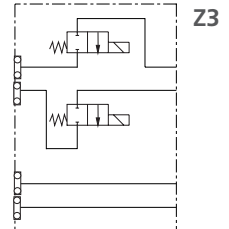
Block with throttle valve



Block with poppet (stop) valve

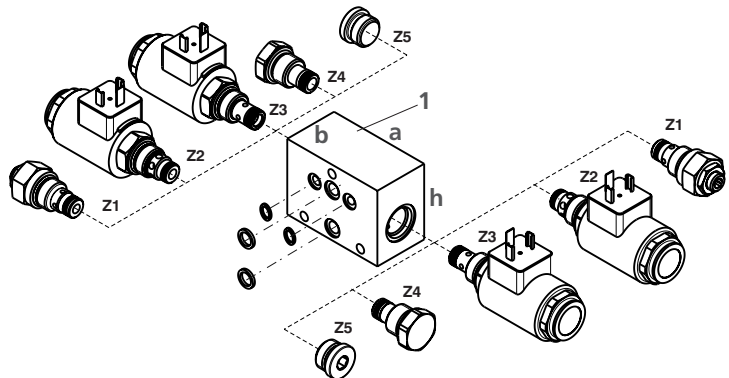
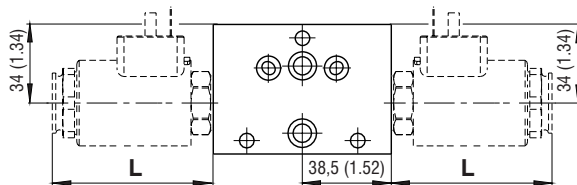


Block with 2/2 Spool-type (stop) valve



Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block with seals	HB03-RPEK-MAB2	-	0.415 (0.92)		29397800
Z1	Needle-restrictor valve	ST2C1A-A2	30 (1.18)		HA 5133	
Z2	Poppet valve	SD1E-A2	70 (2.76)		HA 4070	
Z3	2/2 Spool-type valve	SD2E-A2	70 (2.76)		HA 4040	
Z4	Cavity plug 3/4-16 UNF (closed)	SCP-A2/XX-A	7.5 (0.30)		HA 0050	15960800
Z5	Cavity plug 3/4-16 UNF (open)	SCP-A2/OO-A	3 (0.12)		HA 0050	17250900

Block dimensions [mm (in)]	77 x 40 x 56 (a x b x h) (3.03 x 1.58 x 2.21)
Valve cavity	3/4-16 UNF (A2, C-8-2)

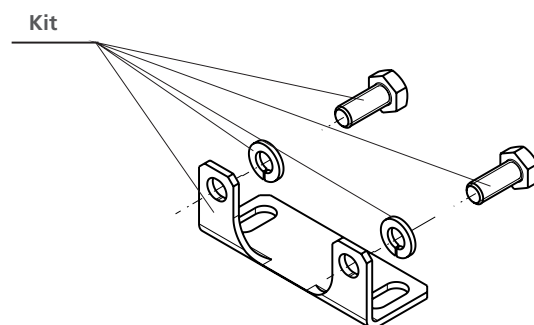
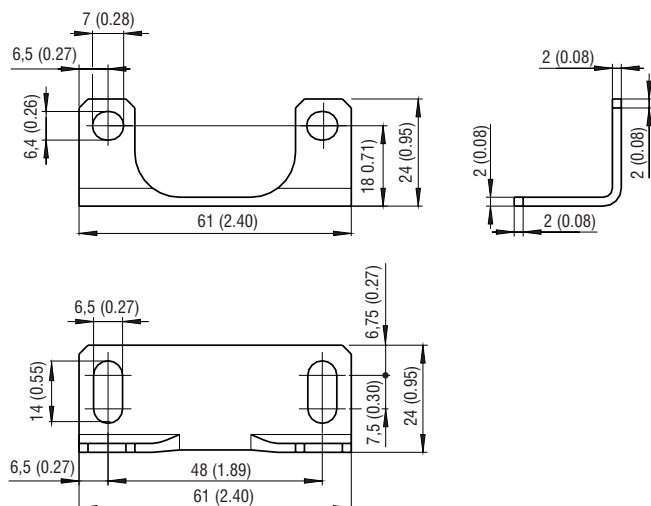


## Mounting bracket

The mounting bracket, made from a 2mm (0.08 in) thick steel sheet, serves to fasten the complete modular block assembly to a plate or frame, etc. Supplied as a kit containing 2 x M6x12 bolts and 2x spring washers. The tightening torque of the bolts is 12 Nm (8.85 lbf.ft).

Note	Name	Items	Order No.
Kit	Mounting bracket	1x Mounting bracket, 2x Bolt M6 x 12, 2x Washer 6	28799600

### Dimensions in millimeters (inches)



## M6 bolts and studs for horizontal integration

Individual blocks and plates in a modular block assembly are connected using M6 bolts and studs. The tightening torque is set at 12 Nm (8.85 lbf.ft).

Calculate the total length (L) of the bolt (up to 100 mm (3.94 in)) or stud (with a length greater than 100 mm (3.94 in))

$$L = (B1 \times X1) + (B2 \times X2) + (B3 \times X3) + Y$$

B1 – block width 40 mm (1.58 in) - (block with valve)

X1 – number of blocks width 40 mm (1.58 in)

B2 – block width 31 mm (1.22 in) - (Plate with Directional Control valve RPEK1-03, Inlet plate)

X2 – number of blocks width 31 mm (1.22 in)

B3 – plate width 14 mm (end plates)

X3 – number of plates width 14 mm (0.55 in)

Y – length of screw-in thread / to fasten the nut with the washer

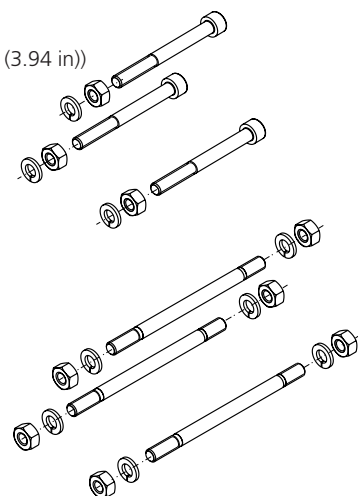
- for bolt - 14 mm (0.55 in)

- for stud - 25 mm (0.98 in)

Select the closest dimension in the table based on the calculated length.

The bolt set includes 3x M6 bolts, 3x M6 nuts and 3x spring washers.

The stud set includes 3x M6 studs, 6x M6 nuts and 6x spring washers.



Bolt M6 – L [mm (in)]	Set Order No.
45 (1.77)	29204400
60 (2.36)	29204600
75 (2.95)	29204800

Bolt M6 – L [mm (in)]	Set Order No.
85 (3.35)	29205000
100 (3.94)	29205100

Stud M6 – L [mm (in)]	Set Order No.
109 (4.29)	29205300
115 (4.53)	29205400
125 (4.92)	29205500
133 (5.24)	29205600
136 (5.35)	29205700
143 (5.63)	29205800
147 (5.79)	29205900
152 (5.99)	29206000
157 (6.18)	29206200
163 (6.42)	29206300
167 (6.57)	29206400
172 (6.77)	29206900
179 (7.05)	29207000
187 (7.36)	29207100
194 (7.64)	29207200
199 (7.83)	29207300
203 (7.99)	29207400
209 (8.23)	29207500

Stud M6 – L [mm (in)]	Set Order No.
219 (8.62)	29207600
224 (8.82)	29207700
229 (9.02)	29207800
236 (9.29)	29207900
245 (9.65)	29208000
253 (9.96)	29208100
256 (10.08)	29208300
259 (10.20)	29208400
265 (10.43)	29208500
273 (10.75)	29208600
279 (10.98)	29208700
287 (11.30)	29208800
295 (11.61)	29208900
300 (11.81)	29209000
309 (12.17)	29209100
314 (12.36)	29209200
320 (12.60)	29209300
328 (12.91)	29209400

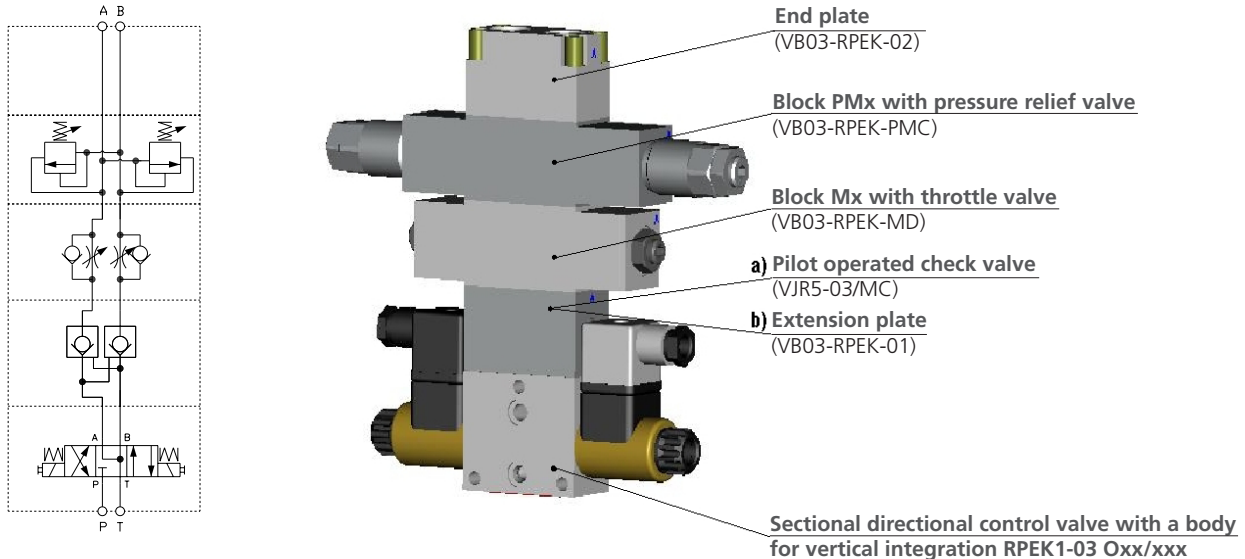
## Modular blocks and plates for vertical integration

The base element for vertical integration is the body of the RPEK1-03 directional control valve with the honed upper surface of the housing, having unthreaded A, B outputs and 4 x M5 threads via which the integrated blocks are mounted to the body of the distributor. The first block is the VJR5-03 pilot operated check valve, which ensures the load position when the pressure source is switched off. A variant is an extension plate which raises the next block above the level of the directional control valve connector sockets.

The Mx block is designed for a built-in throttle valve to control flow in channels A, B of the actuator.

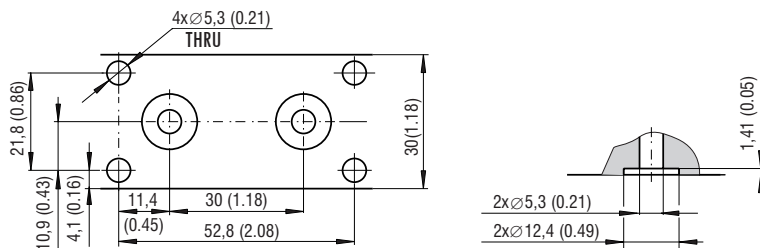
The PMx block is designed for a built-in crossport pressure relief valve, insuring both A and B channels of the actuator against pressure overload.

The valve stack is closed by an end plate enabling connection to the actuator.



## Mounting interface of block for vertical integration

In general, the upper surface is honed, the underside channels A, B have recesses for sealing rings. The blocks have a uniform width of 30mm (1.18 in), but various heights and lengths.



## Overview of blocks and plates for vertical integration

Name	Order No.	Description
VB03-RPEK-01	28131500	Extension plate (instead of pilot operated check valve)
VJR5-03		Pilot operated check valve (datasheet HC 5027)
VB03-RPEK-MC	28672500	Block with valve VSV2-QC2/J1 for meter-in flow regulation in channels A, B
VB03-RPEK-MD	28672400	Block with valve VSV2-QC2/J1 for meter-out flow regulation in channels A, B
VB03-RPEK-PMC	28672700	Block with crossport pressure relief valve SR1A-A2 for pressure insurance of both A and B channels
VB03-RPEK-02	28130400	End plate for connecting the actuator; A, B ports on upper surface with G1/4 threads
VB03-RPEK-02-S	29008900	End plate for connecting the actuator; A, B ports on upper surface with SAE 6 threads
VB03-RPEK-03	28476200	End plate for connecting the actuator; A, B side ports with G1/4 threads
VB03-RPEK-03-S	29009000	End plate for connecting the actuator; A, B side ports with SAE 6 threads
VB03-RPEK-04	28672900	End plate for connecting the actuator; A, B side ports with G 3/8 threads
VB03-RPEK-05	29585100	Gauge port plate for connecting the actuator (side ports G1/4) and gauge block (honed top surface)



Pilot Operated Check Valve, Pilot to Open, Ball-Type, Bankable

**VJR5-03/M**

Size 03 •  $Q_{max}$  20 l/min (5 GPM) •  $p_{max}$  250 bar (3600 PSI)

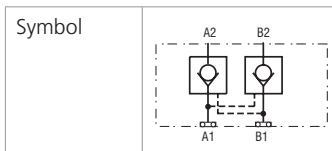


**Technical Features**

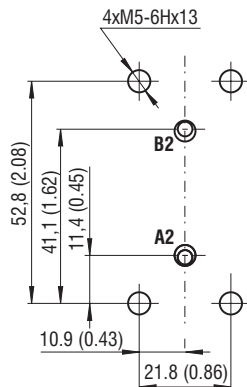
- › Pilot operated check valve in a modular block designated for vertical integration to the modular block RPEK1-03/B
- › High grade seat and heat treated ball increase resistance against contamination
- › Low volume loss and long lifespan even with high adjustment frequencies
- › High flow capacity
- › In the standard version, the housing is unplated aluminium alloy and the steel parts are zinc-coated for 240 h protection in NSS acc. to ISO 9227

**Functional Description**

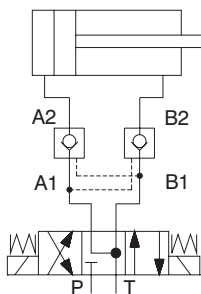
Pilot operated check valve assures a position of the load connected to the actuator when the pressure source is disconnected. The check valve is closed by the fluid pressure induced by the load acting at the actuator. The fluid flows freely through the check valve to the actuator A(B)1 → A(B)2. In the opposite flow direction A(B)2 → A(B)1, the check valve is normally closed. To open it, pressure is required in the pilot channel that acts on the front of control piston. This mechanically opens the cone, thus releasing flow in the closing direction A(B)2 → A(B)1 from the actuator to the tank. The pilot ratio is 3:1, meaning a minimum of one-third of the load pressure is required to open the valve. The valve is spring closed.



**Mounting interface**



**Typical circuit with pilot operated check valve**



**Technical Data**

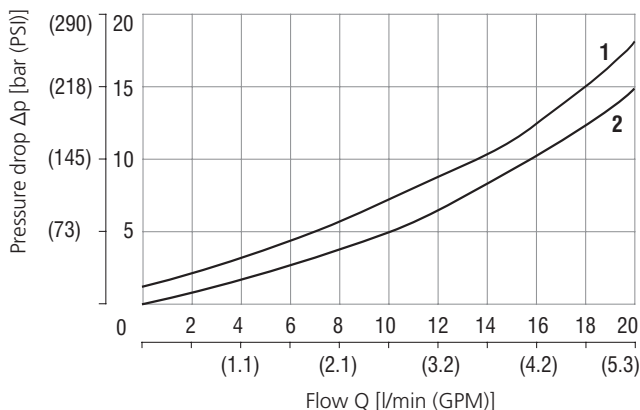
Valve size		03
Max. flow	l/min (GPM)	20 (5.3)
Max. operating pressure	bar (PSI)	250 (3630)
Cracking pressure	bar (PSI)	1 (14.5)
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... +212)
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... +248)
Area ratio (pilot piston / seat)		3 : 1
Weight	kg (lbs)	0.2 (0.44)

	Data Sheet	Type
General information	GI_0060	Products and operating conditions
Mounting interface	SMT_0019	Size 03, RPEK directional valve
Spare parts	SP_8010	

**Characteristics** measured at  $v = 32 \text{ mm}^2/\text{s}$  (156 SUS)

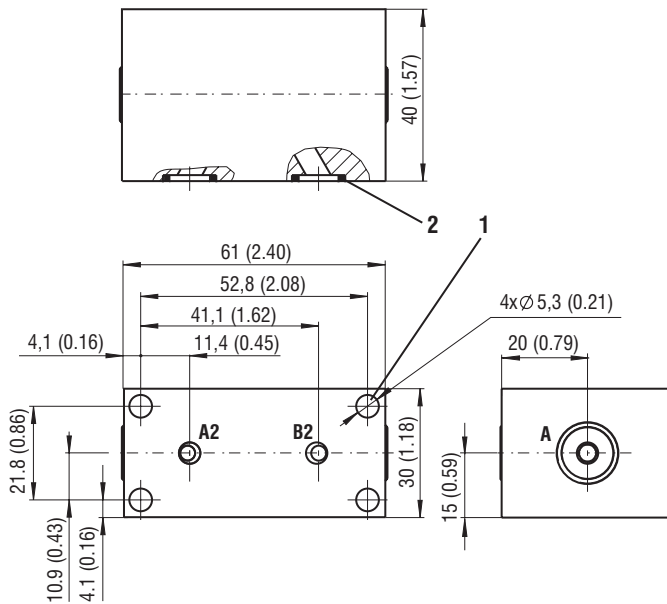
**Pressure drop related to flow rate**

Pressure drop measured with distributor RPEK1-03O3Y11



	Flow direction
1	A1→A2 (B1→B2)
2	A2→A1 (B2→B1)

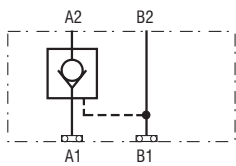
## Dimensions in millimeters (inches)



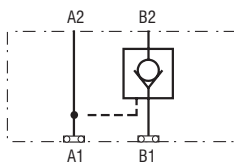
1	4 mounting holes
2	Square ring 9.25x1.68 (2 pcs.) supplied with valve

## Spool Symbols

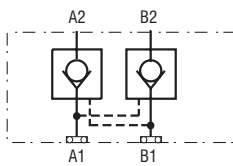
VJR5-03/MA



VJR5-03/MB



VJR5-03/MC



② Consumer side

① RPEK directional valve side

**Notice:** The orientation of the symbol on the name plate corresponds with the valve function.

## Ordering Code

VJR5-03 / M  3 - 010  -

Pilot operated check valve,  
pilot to open, ball-type, bankable

Valve size

Modular plate design

Spool symbols

check valve in line A  
check valve in line B  
check valve in line A and B

A  
B  
C

Area ratio (pilot piston / seat)  
3 : 1

**Surface treatment**  
A (standard) aluminum housing, steel parts  
zinc-coated (ZnCr-3), ISO 9227 (240 h)  
B aluminum housing, steel parts  
zinc-coated (ZnNi), ISO 9227 (520 h)

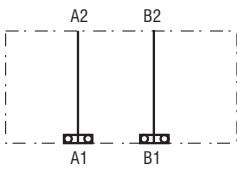
No designation  
V

**Seals**  
NBR  
FPM (Viton)

**Free flow check valve cracking pressure**  
1 bar (14.5 PSI)

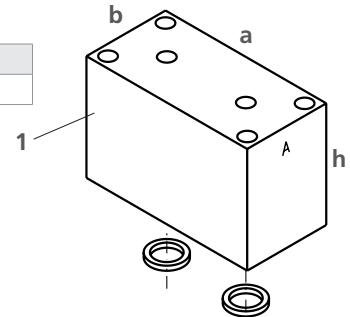
### Extension plate VB03-RPEK-01

Extension plates must be used for vertical integration in the case that a VJR5-03/MC hydraulic lock is not connected. It ensures assembly space for the valve.



Position	Name	Type	max. L [mm]	m [kg (lbs)]	Datasheet	Order No.
1	Plate with seal	VB03-RPEK-01	-	0.189 (0.42)		28131500

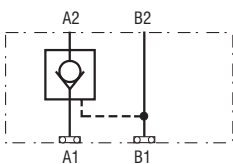
Plate dimensions [mm (in)]	61 x 30 x 40 (a x b x h) (2.40 x 1.18 x 1.58)
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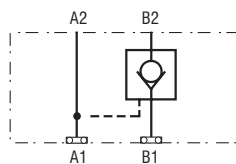
### Pilot operated check valve VJR5-03/Mx

The pilot operated check valve ensures the load position of the actuator when the pressure source is off. Designwise, this is a check valve, opened mechanically by pressure from the second branch of the actuator. It can be built either into one channel of the actuator (MA, MB) or both channels A, B (MC).

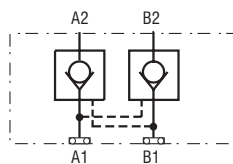
**VJR5-03/MA**



**VJR5-03/MB**

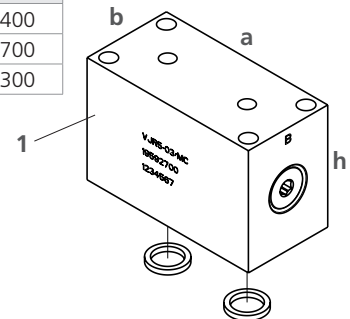


**VJR5-03/MC**



Position	Name	Type	max. L [mm]	m [kg (lbs)]	Datasheet	Order No.
1	Pilot operated check with seal	VJR5-03/MA	-	0.200 (0.44)	HA 5027	32168400
1	Pilot operated check with seal	VJR5-03/MB		0.216 (0.48)	HA 5027	32168700
1	Pilot operated check with seal	VJR5-03/MC		0.200 (0.44)	HA 5027	30984300

Block dimensions [mm (in)]	61 x 30 x 40 (a x b x h) (2.40 x 1.18 x 1.58)
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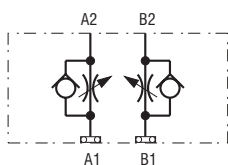


### Block VB03-RPEK-Mx with throttle valve

The Mx block is designed for the installation of throttle valves with bypass check valves. The valves serve to adjust flow in channels A, B of the actuator independently.

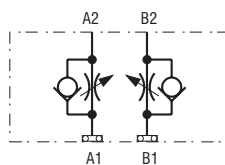
Depending on the type selected, flow will be throttled in the direction to the actuator (MC) or from the actuator (MD). The set flow rate will vary in accordance to the pressure drop on the valve.

**MC**



Throttle valve flow control in the direction of the actuator

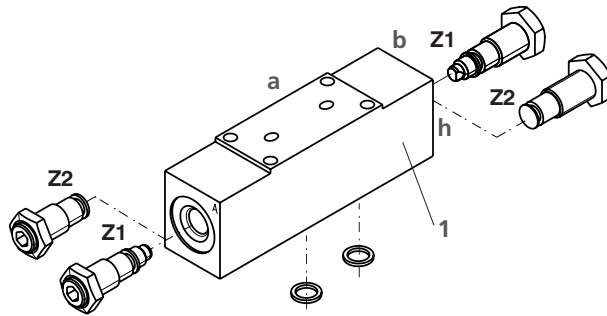
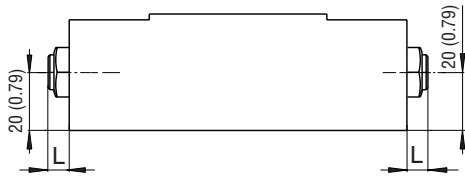
**MD**



Throttle valve flow control in the direction from the actuator

Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block + seals for construction MC	VB03-RPEK-MC	-	0.361 (0.80)		28672500
	Block + seals for construction MD	VB03-RPEK-MD	-	0.361 (0.80)		28672400
Z1	Throttle valve with bypass	VSV2-QC2/J1	11 (0.43)		HA 5132	
Z2	Cavity plug M12 x 1 (opend)	SCP-QC2/OO-A			HA 0050	28022400

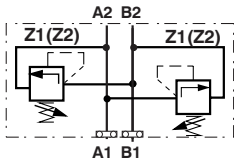
Block dimensions [mm (in)]	61 x 30 x 40 (a x b x h) (2.40 x 1.18 x 1.58)
Valve cavity	M12 x 1 (QC2)



### Block VB03-RPEK-PMx block with crossport pressure relief valves

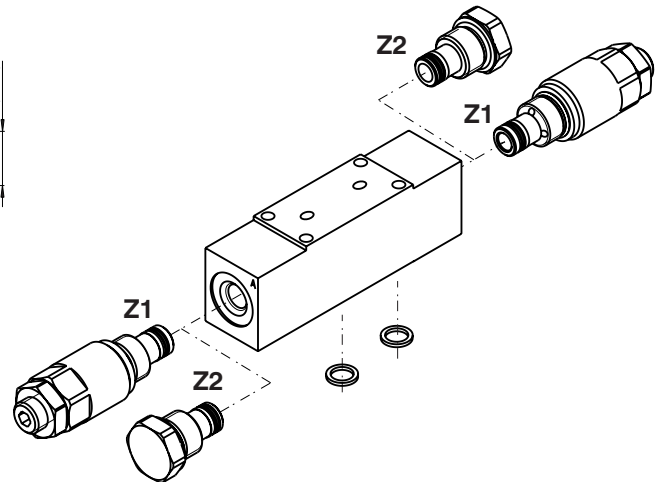
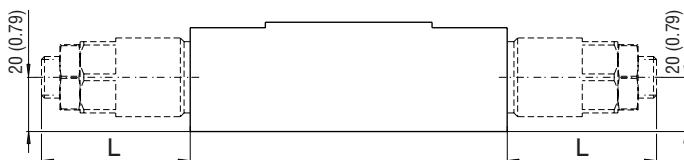
The PMx block is designed for pressure relief valves, against pressure overload ( $A \rightarrow B$ ,  $B \rightarrow A$ ).

#### MC



Position	Name	Type	max. L [mm (in)]	m [kg (lbs)]	Datasheet	Order No.
1	Block + seals for construction MC	VB03-RPEK-PMx	-	0.349 (0.77)		28672700
Z1	Pressure valve	SR1A-A2	78 (3.07)		HA 5063	
Z2	Cavity plug 3/4-16 UNF (closed)	SCP-A2/XX-A	7.5 (0.30)		HA 0050	15960800

Block dimensions [mm (in)]	130 x 30 x 40 (a x b x h) (5.12 x 1.18 x 1.58)
Valve cavity	3/4-16 UNF (A2, C-8-2)

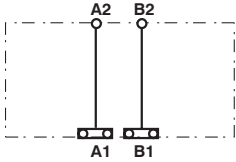


## Cover plates VB03-RPEK-0x (-S)

Plates designated 02 have A, B ports on the upper surface, plates designated 03, 04, and 05 have side ports A, B. 03 and 04 plates differ due to connection threads (G 1/4, G 3/8).

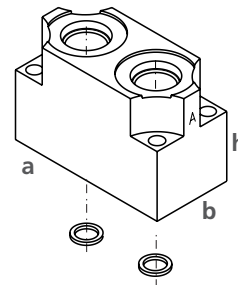
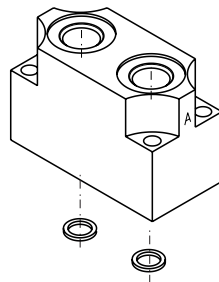
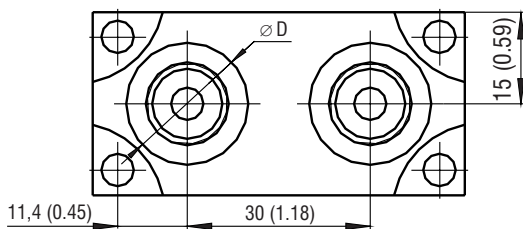
### Cover plate VB03-RPEK-02 (-S)

The 02 plate design has A, B ports with connection threads on the upper surface.



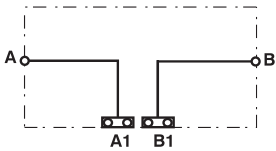
Name	Type	Thread A, B	Depth	m [kg (lbs)]	Order No.
Plate + seals	VB03-RPEK-02	G 1/4	Ø 20 <sup>+0,5</sup>	0.172 (0.38)	28130400
Plate + seals	VB03-RPEK-02-S	SAE 6	9/16-18 UNF	0.172 (0.38)	29008900

Plate dimensions [mm (in)] 61 x 30 x 40 (a x b x h)  
(2.40 x 1.18 x 1.58)



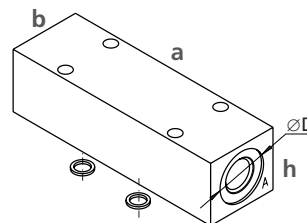
### Cover plate VB03-RPEK-03 (-S) a VB03-RPEK-04

The 03, 04 plate design have outputs A, B with connection threads on the sides. Plates 03 and 04 differ due to (G 1/4, G 3/8) connection threads.



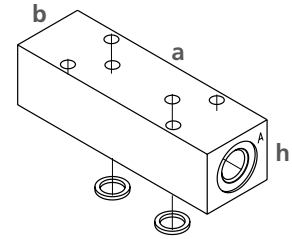
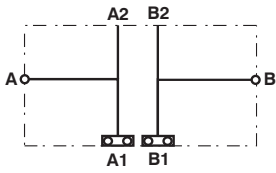
Name	Type	Thread A, B	Depth	m [kg (lbs)]	Order No.
Plate + seals	VB03-RPEK-03	G 1/4	Ø 20 <sup>+0,5</sup>	0.131 (0.29)	28476200
Plate + seals	VB03-RPEK-03-S	SAE 6	9/16-18 UNF	0.131 (0.29)	29009000
Plate + seals	VB03-RPEK-04	G 3/8	Ø 23 <sup>+0,5</sup>	0.177 (0.39)	28672900

Plate dimensions [mm (in)] 95 x 30 x 26 (a x b x h)  
(3.74 x 1.18 x 1.02)



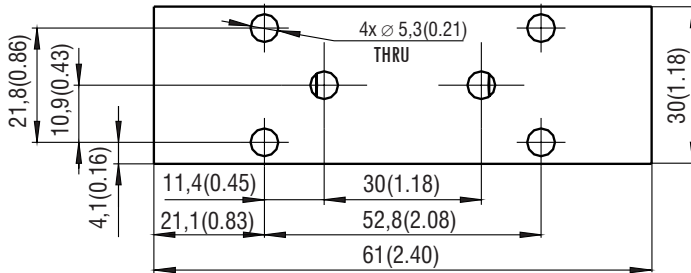
## Gauge port plate VB03-RPEK-05

The 05 plate has threaded A, B ports on the sides and upper honed surface with output channels A, B.



Name	Type	Thread A, B	m [kg (lbs)]	Order No.
Plate + seals	VB03-RPEK-05	G 1/4	0.128 (0.28)	29585100

Plate dimensions [mm (in)]	95 x 30 x 26 (a x b x h) (3.74 x 1.18 x 1.02)
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## M5 bolts for vertical integration

Individual blocks are vertically assembled by means of 4 M5 bolts. The tightening torque is set to 5 Nm (3.69 lbf.ft).

Total bolt length calculation (L):

$$L = (H1 \times X1) + H2 + Y = (40 \times H1) + 35$$

H1 – individual block height 40 mm (1.58 in)

X1 – number of blocks of height 40 mm (1.58 in)

H2 – individual height of cover plate 26 mm (1.02 in)

Y – thread screw length 9 mm (0.35 in)

Select the closest dimension in the table based on the calculated length. Bolt set has 4 M5 bolts.

Bolt M5 – L [mm (in)]	Set Order No.
75 (2.95)	29245200
115 (4.53)	29245300
155 (6.10)	29245400