

Seated valve 500

Type WVM-4B

NG 4
up to 12 l/min

Features

- Direct operated
- Leakage free
- Good resistance to corrosion
- As 2/2-, 3/2-, 3/3-, 4/2-* or 4/3-valve with solenoid or alternative actuation

* pilot-operated



Design

- With hardened closing elements as cone or ball seat
- Functions with negative or positive overlap
- Solenoids with slide on coil technology
- Mounting on single subplate (EAP) as stand-alone valve or in valve bank with supplate (APH)

Applications

- Controlling of cylinders and motors in higher pressure ranges as full replacement for spool valve technology (especially for leakage free holding, bending and clamping)
- In machine tools, hoisting technology, test stands and rescue devices
- Power units (e.g. as with limited space conditions or weight reduction)

Technical data

Hydraulic fluid	Mineral oil according to DIN 51524 (other fluids on request)
Fluid temperature range	-20 to 80 °C
Ambient temperature range	-30 to 50 °C
Viscosity range	5 to 400 mm ² /s
Porting	NG 4
Max. operating pressure	500 bar continuous pressure (S1) / Higher pressures up to 700 bar temporary allowed! Pressure difference from P to A, B to T must be adhered! ($p_p > p_A \geq p_B > p_T$) / 4/3-way valve $p_{Tmax} = 350$ bar
Duty cycle DC	100% (at continuous pressure operation) → For higher pressures see characteristic hydraulic switching power
Max. flow rate	12 l/min
Filtration	According NAS 1638 class 6 resp. ISO/DIN 4406 17/15/12
DIN connector (2P + E)	According EN 175301-803 / ISO 4400 / DIN 43650
Power	Solenoid: 24 VDC (23 W) / 110 VAC (25 W) / 230 VAC (25 W)
Power tolerance	+/- 10%
Switching time	40 - 120 ms
Degree of protection according DIN 40050	IP 63 (solenoid IP 65)
Material	Corrosion-resistant steel and aluminium (coil housing: ZnFe - corrosion protection)

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NG 4
up to 12 l/min

Ordering codes WVM, APH and EAP

Example WVM		WV	M	-	4B	-	2	/	2	-	WS	-	24	-	V	-	A		00
Seated valve																			
Type	500+																		
Nominal size	4																		
Connection Bieri	...B																		
Connection in-line body	...R*																		
*only for 4/3-U stand-alone valve (in-line body)																			
Ports	2, 3 or 4																		
Positions	2 or 3																		
Functions	see product information valve types																		
Actuator types	24 solenoid 24 VDC 110 solenoid 110 VAC 230 solenoid 230 VAC HF(Q*/L*) manual lever/spring return/(lateral*/lengthwise*) HR(Q*/L*) manual lever/with detent (lateral*/lengthwise*) AIR pneumatic OIL hydraulic TS pin TR roller * () only for 3/3- and 4/3-valve																		
Seal material	V [FPM] other seal materials on request																		
		<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Special design 01 ... 99 (00 for standard)</p> </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 10px;"> <p>Part index Please leave blank (small letters a-d; defferent letters do not effect inter- changeability)</p> </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 10px;"> <p>Desing revision Capital letters A-Z; iden- tical letters equal same connecting dimensions</p> </div>																	

Example APH

APH - 4B - 2 / 2 - AT - G1/4 - V - A - 00

Subplate	
Nominal size	4
Porting	...B
Ports	2, 3 or 4
Positions	2 or 3
Internal connection	PA P - A (2/2-valve) AT A - T (2/2-valve) PT P - T (2/2-valve) X for 3/2, 3/3, 4/2 and 4/3
Threaded connections (in-line body)	G1/4 G 1/4" G3/8 G 3/8" X no external port for P - T
Seal material	V [FPM] other seal materials on request

Special design
01 ... 99
(00 for standard)

Part index
Please leave blank
(small letters a-d; defferent letters do not effect interchangeability)

Desing revision
Capital letters A-Z; identical letters equal same connecting dimensions

Example EAP

EAP - 4B - 2 / 2 - G1/2 - A - 00

Single Subplate	
Nominal size	4
Porting	...B
Ports	2, 3 or 4
Positions	2 or 3
Threaded connections	G1/4 G 1/4" G3/8 G 3/8" G1/2 G 1/2"

Special design
01 ... 99
(00 for standard)

Part index
Please leave blank (small letters a-d; defferent letters do not effect interchangeability)

Desing revision
Capital letters A-Z; identical letters equal same connecting dimensions

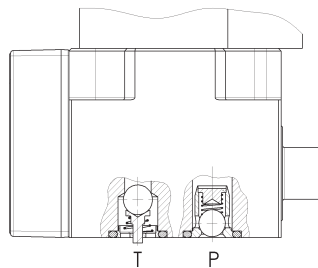
Type WVM-4BNG 4
up to 12 l/min**Spare parts set WVM**

Description	Part.-No.
5 pcs. O-Ring, 5 x 1,5 mm, FPM	3853409
5 pcs. O-Ring, 8 x 1,5 mm, FPM	
4 pcs. Fixing screw, M6 x 35 mm	
4 pcs. Fixing screw, M6 x 60 mm	
1 pce. Seal cover plate for port B	

Solenoid	Part No.
Solenoid 24 VDC	3546095
Solenoid 110 VAC	3547372
Solenoid 230 VAC	3547373
Plastic nut	4006061
O-Ring for plastic nut	4006140

Accessories (optional)

Type	Valve type	Item description	Part No.
RVH700-4B-D6,5-X-A*00	2/2, 3/2, 4/2, 3/3	Check valve (fitting in connection P)	3680704
	2/2, 3/2, 4/2, 3/3	Return pressure stop (fitting in connection T)	3687580
	All types	Plug for solenoid (black)	3728850
LRS KPL Z4 TR 2PoI LED	All types	Plug for solenoid with integrated reduction of performance	3689354



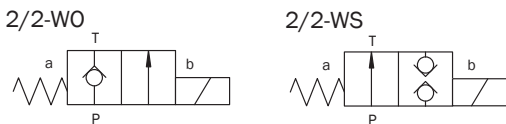
Product information 2/2-valve

Functions WO and WS

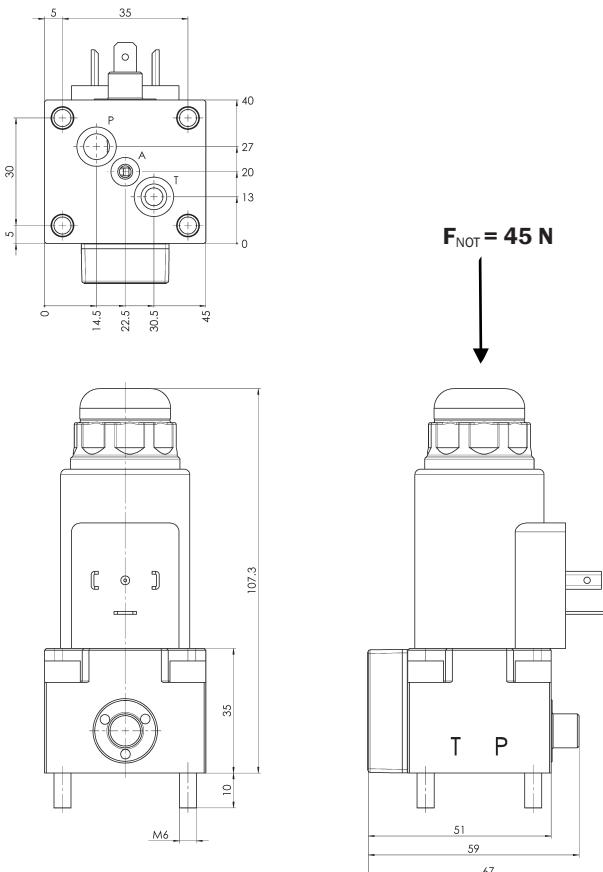
Actuator type	Weight ca. [kg]	Part No. 2/2-WO	Weight ca. [kg]	Part No. 2/2-WS
Solenoid 24 VDC	0,85	3832384	0,85	3832434
Solenoid 110 VAC	0,85	3832426	0,85	3832448
Solenoid 230 VAC	0,85	3832427	0,85	3832449
Manual lever / spring returned	0,80	3832428	0,80	3832450
Manual lever / with detent	0,80	3832430	0,80	3832452
Pneumatic	0,80	3832431	0,80	3832453
Hydraulic	0,80	3832432	0,80	3832454
Pin	0,80	3832433	0,80	3832456
Roller	0,80	3840701	0,80	3840726

Note: Characteristics see page 21 / technical data actuators see pages 22-24

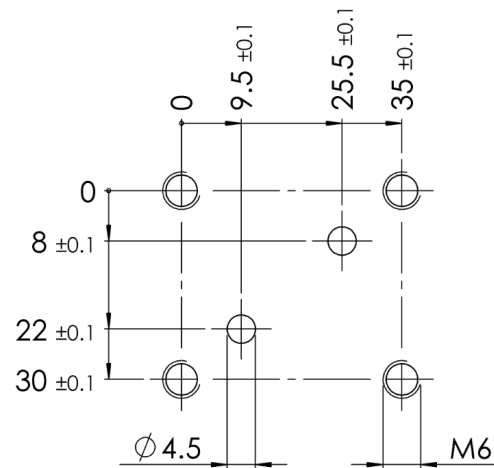
Hydraulic schematics



Dimensional drawing (solenoid operated)



Pattern of drilling for 2/2-valve



**Subplates APH for 2/2-valve
(valve bank - example see page 20)**

Internal connection	Threaded connection Dim. G* ["]	Dim. H* [mm]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
P - A	G 1/4	15	25	0,35	3832459
P - A	G 3/8	14	28	0,35	3832460
A - T	G 1/4	15	25	0,35	3832457
A - T	G 3/8	14	28	0,35	3832458
P - T				0,35	3832461

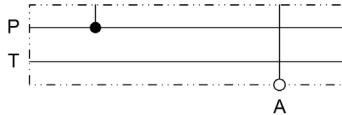
* see drawings below

Attention: Mounting elements for APH have to be ordered seperately (see pages 19-20)!

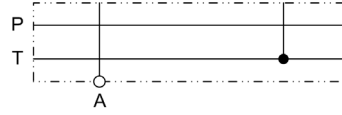
Note: For additional functions in subplates APH see data sheets size 500+ (ERVM, etc.)

Hydraulic schematics

P - A



A - T

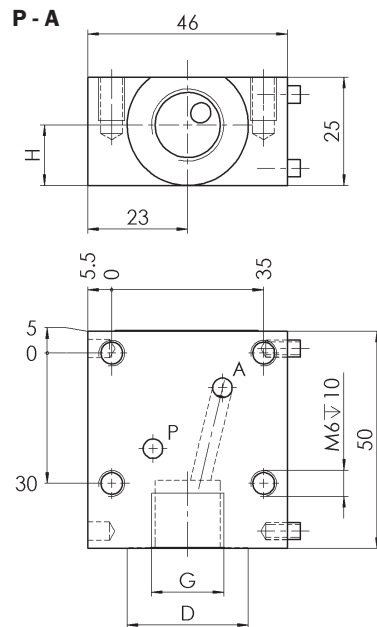


P - T

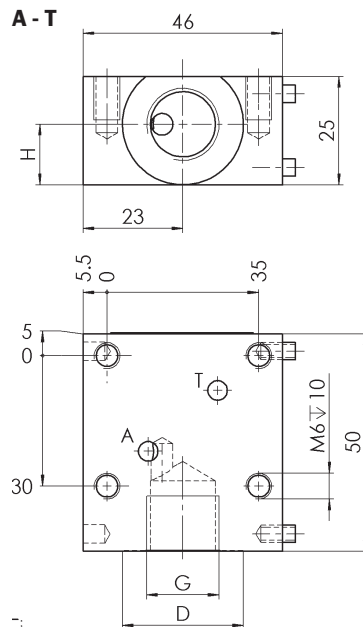


Dimensional drawings

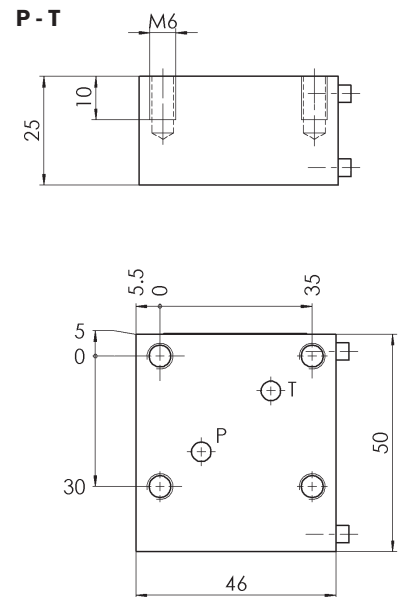
P - A



A - T



P - T



**Single subplates EAP for 2/2-valve
(in-line mounting)**

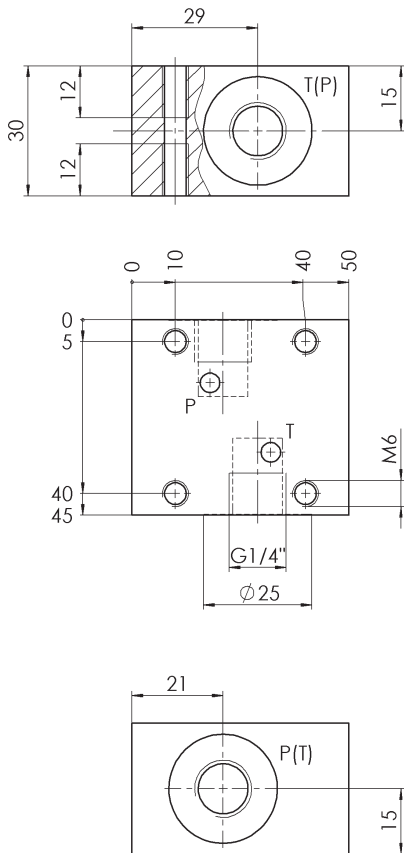
Threaded connection Dim. G ["]	Weight ca. [kg]	Part No.
G 1/4	0,45	3763413
G 3/8	0,45	3807978
G 1/2	0,75	3832462

Hydraulic schematics

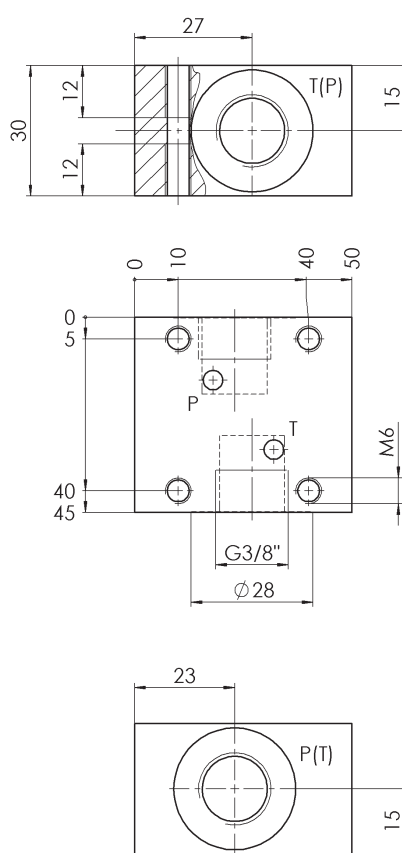


Dimensional drawings

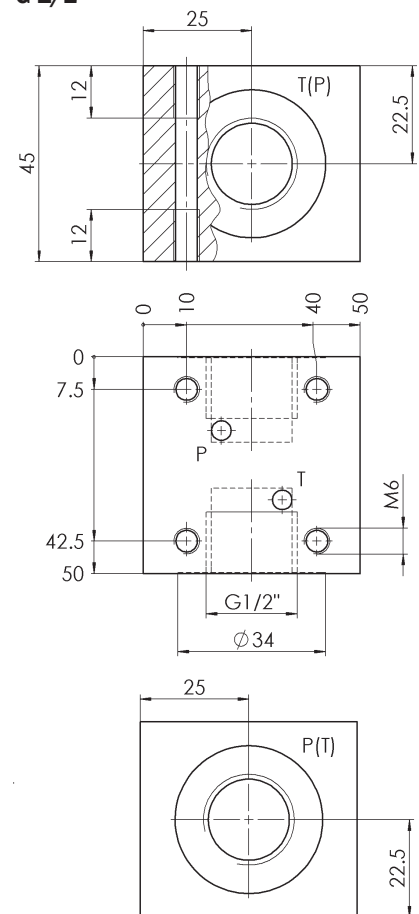
G 1/4"



G 3/8"



G 1/2"



Type WVM-4B

NG 4
up to 12 l/min

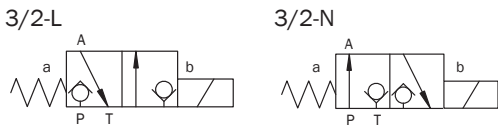
Product information 3/2-valve

Functions L and N (negative overlap*)

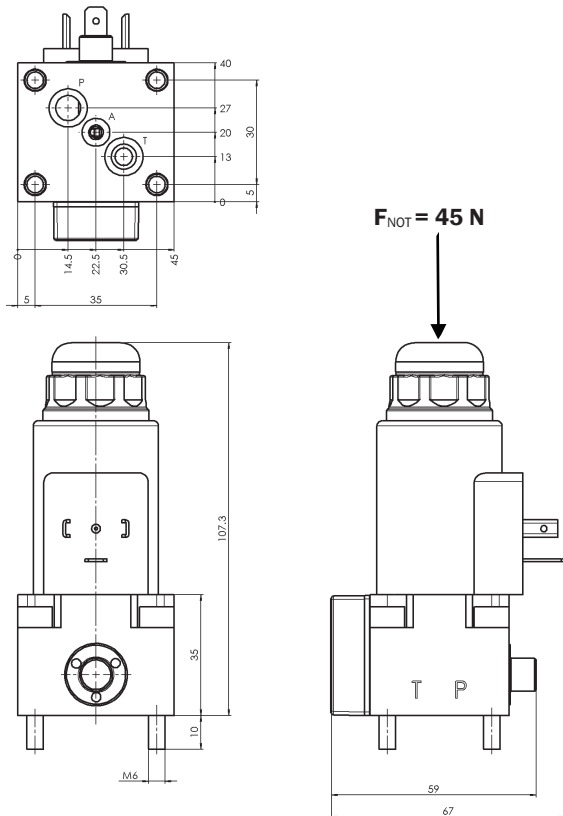
Actuator type	Weight ca. [kg]	Part No. 3/2-L	Weight ca. [kg]	Part No. 3/2-N
Solenoid 24 VDC	0,85	3832477	0,85	3832485
Solenoid 110 VAC	0,85	3832478	0,85	3832487
Solenoid 230 VAC	0,85	3832479	0,85	3832488
Manual lever / spring returned	0,80	3832480	0,80	3832489
Manual lever / with detent	0,80	3832481	0,80	3832490
Pneumatic	0,80	3832482	0,80 <td 3832491	
Hydraulic	0,80	3832483	0,80	3832492
Pin	0,80	3832484	0,80	3832494
Roller	0,80	3840729	0,80	3840732

Note: Characteristics see page 21 / technical data actuators see pages 22-24

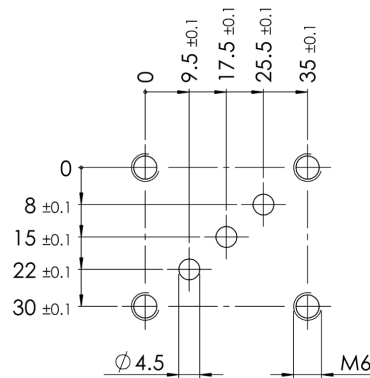
Hydraulic schematics



Dimensional drawing (solenoid operated)



Pattern of drilling for 3/2-valve



Subplates APH for 3/2-valve (valve bank - example see page 20)

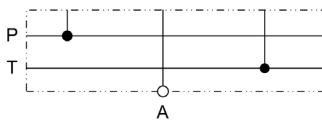
Threaded connection Dim. G* ["]	Dim. H* [mm]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	15	25	0,35	3832495
G 3/8	14	28	0,35	3832496

* see drawing below

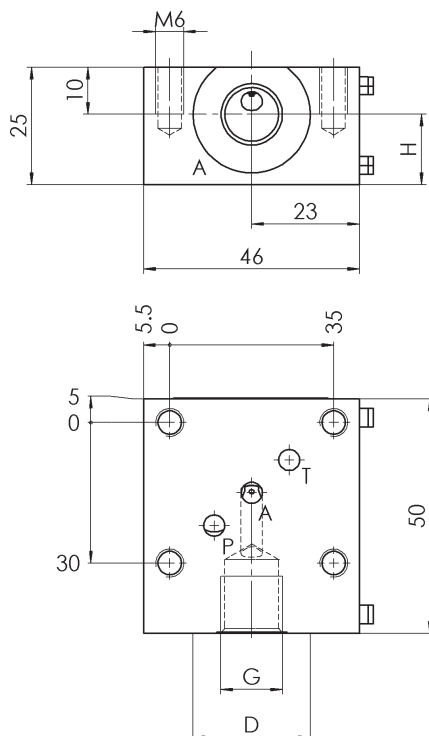
Attention: Mounting elements for APH have to be ordered separately (see pages 19-20)!

Note: For additional functions in subplates APH see data sheets size 500+ (ERVM, etc.)

Hydraulic schematics



Dimensional drawing



**Single subplates EAP for 3/2-valve
(in-line mounting)**

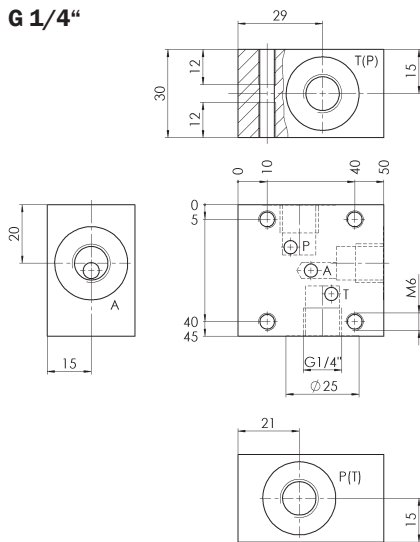
Threaded connection Dim. G ["]	Weight ca. [kg]	Part No.
G 1/4	0,45	3832498
G 3/8	0,45	3832499
G 1/2	0,70	3832497

Hydraulic schematics

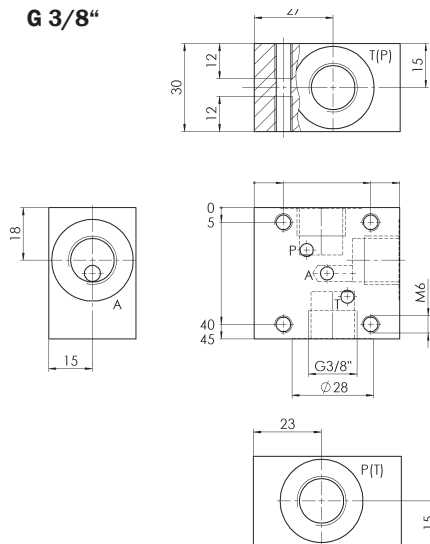


Dimensional drawings

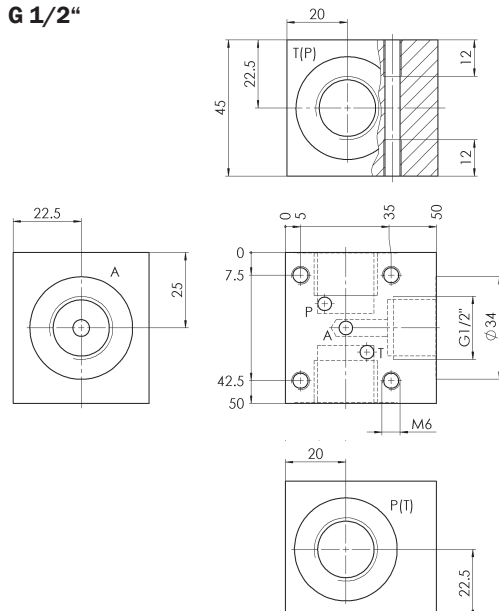
G 1/4"



G 3/8"



G 1/2"



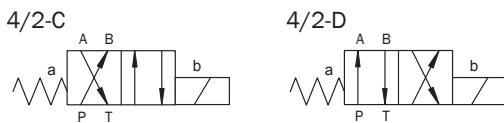
Product information 4/2-valve

Functions C and D (negative overlap)

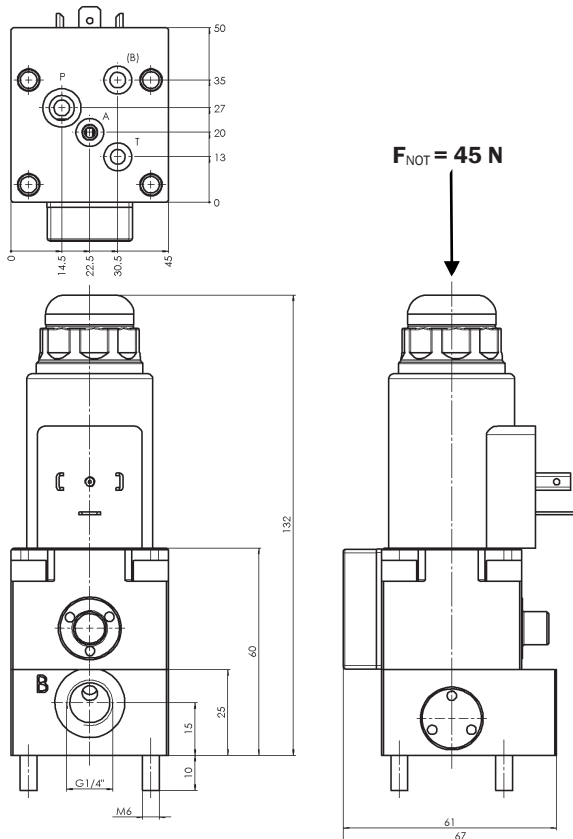
Actuator type	Weight ca. [kg]	Part No. 4/2-C	Weight ca. [kg]	Part No. 4/2-D
Solenoid 24 VDC	1,20	3832514	1,20	3832522
Solenoid 110 VAC	1,20	3832515	1,20	3832523
Solenoid 230 VAC	1,20	3832516	1,20	3832524
Manual lever / spring returned	1,15	3832517	1,15	3832525
Manual lever / with detent	1,15	3832518	1,15	3832526
Pneumatic	1,15	3832519	1,15	3832527
Hydraulic	1,15	3832520	1,15	3832528
Pin	1,15	3832521	1,15	3832529
Roller	1,15	3840734	1,15	3840735

Note: Characteristics see page 21 / technical data actuators see pages 22-24

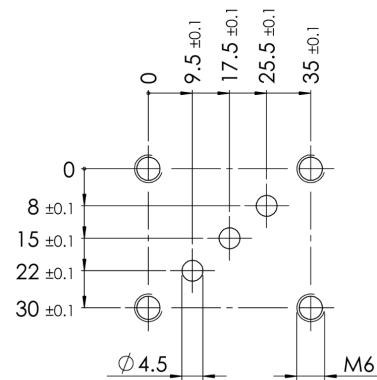
Hydraulic schematics



Dimensional drawing (solenoid operated)



Pattern of drilling for 4/2-valve



Seal cover plate (see spare parts set page 3) has to be mounted in port B when a subplate from Bieri is used!

Subplates APH for Function 4/2 (valve bank - example see page 20)

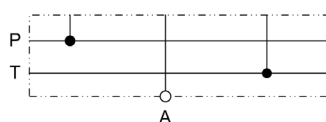
Threaded connection Dim. G* ["]	Dim. H* [mm]	Dim. D* Ø [mm]	Weight [kg]	Part No.
G 1/4	15	25	0,35	3832530
G 3/8	14	28	0,35	3832532

* see drawing below

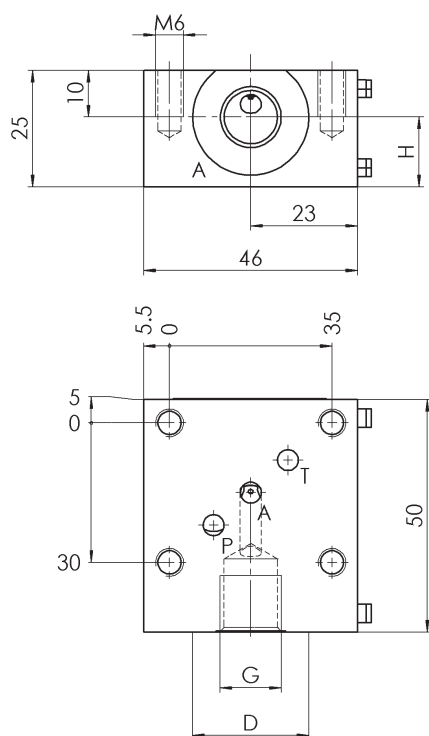
Attention: Mounting elements for APH have to be ordered seperately (see pages 19-20)!

Note: For additional functions in subplates APH see data sheets size 500+ (ERVM, etc.)

Hydraulic schematics



Dimensional drawing



**Single subplates EAP for 4/2-valve
(in-line mounting)**

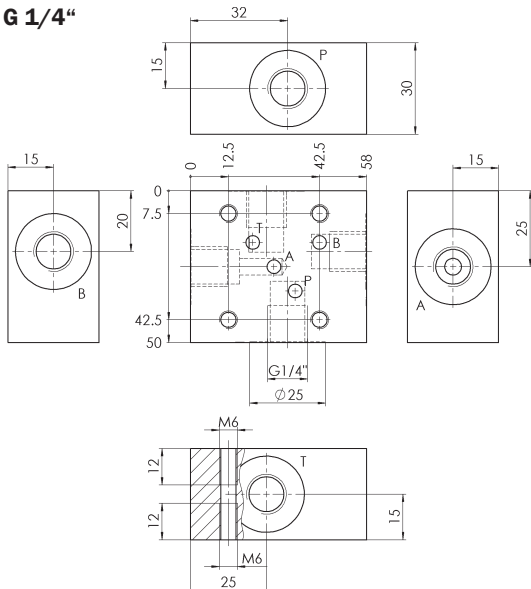
Threaded connection Dim. G ["]	Weight ca. [kg]	Part No.
G 1/4	0,45	3832534
G 3/8	0,45	3832535
G 1/2	0,70	3832533

Hydraulic schematics

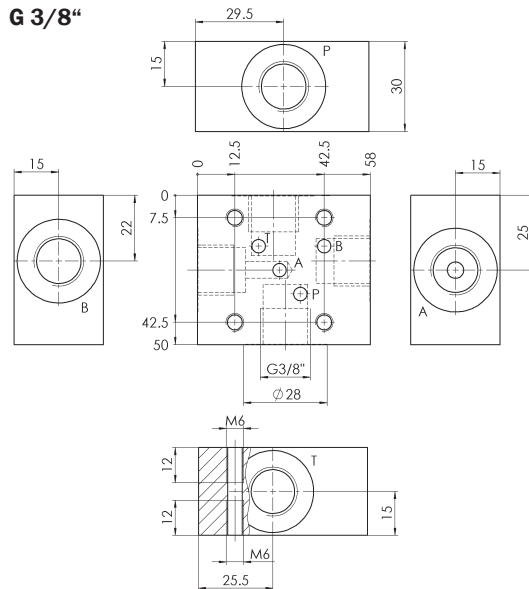


Dimensional drawings

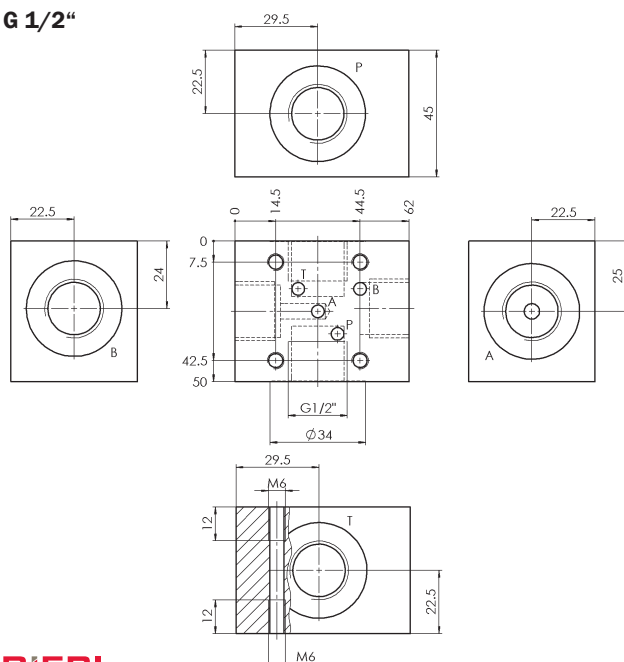
G 1/4"



G 3/8"



G 1/2"



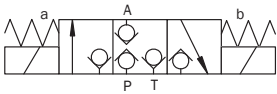
Product information 3/3-valve

Function K

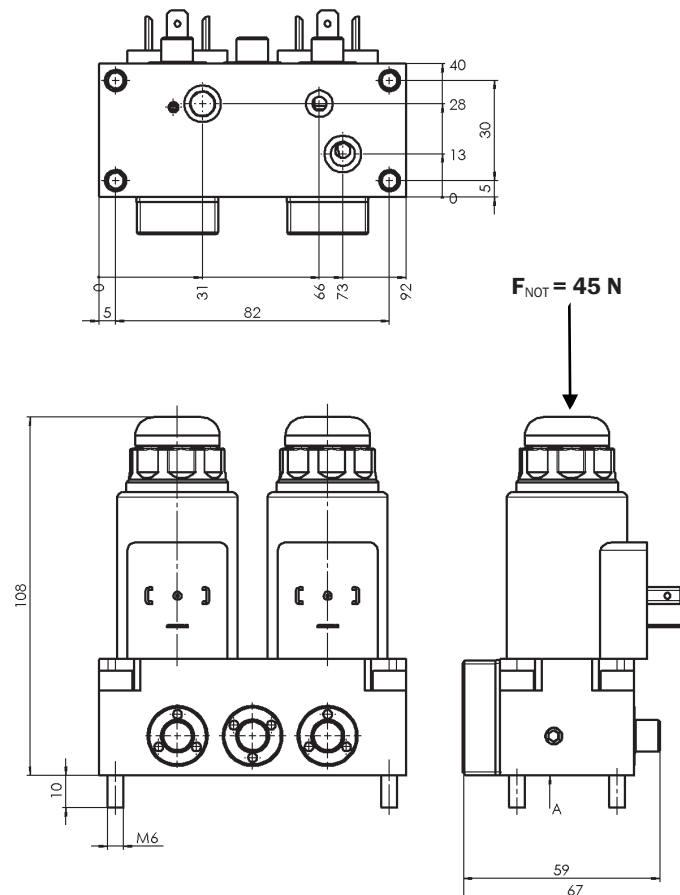
Actuator type	Weight ca. [kg]	Part No. 3/3-K
Solenoid 24 VDC	1,75	3832500
Solenoid 110 VAC	1,75	3832501
Solenoid 230 VAC	1,75	3832502
Manual lever/spring returned (lateral)	1,70	3832503
Manual lever/spring returned (lengthwise)	1,70	3839873
Manual lever/with detent (lateral)	1,70	3832504
Manual lever/with detent (lengthwise)	1,70	3839874
Pneumatic	1,70	3832505
Hydraulic	1,70	3832506
Pin	1,70	3832507
Roller	1,70	3840733

Note: Characteristics see page 21 / technical data actuators see pages 22-24

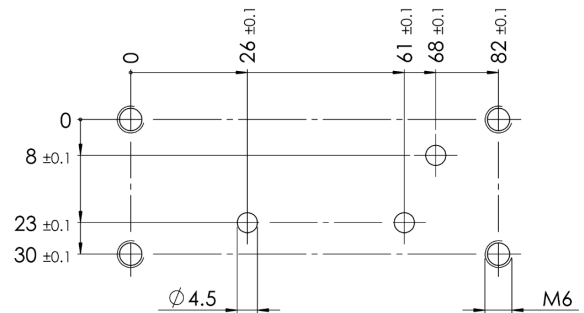
Hydraulic schematic



Dimensional drawing (solenoid operated)



Pattern of drilling for 3/3-valve



Subplates APH for 3/3-valve (valve bank - example see page 20)

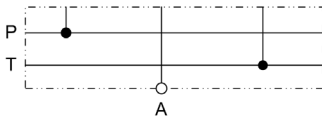
Threaded connection Dim. G* ["]	Dim. H* [mm]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	15	25	0,75	3832508
G 3/8	14	28	0,75	3832509

* see drawing below

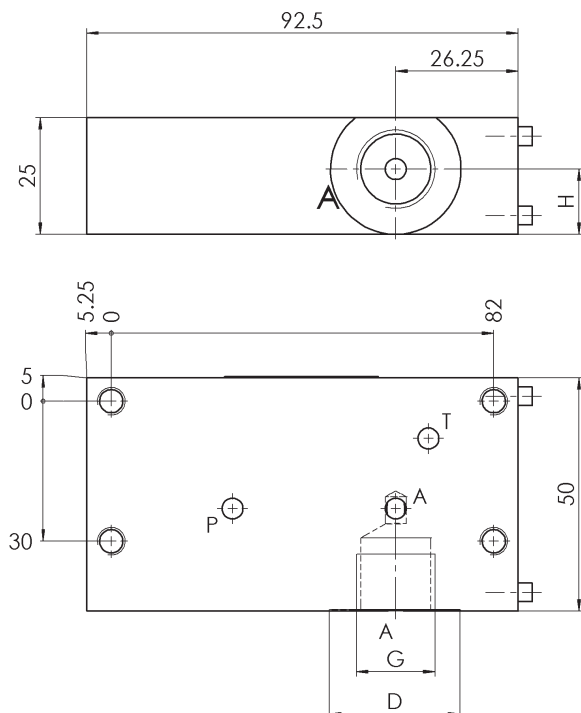
Attention: Mounting elements for APH have to be ordered separately (see pages 19-20)!

Note: For additional functions in subplates APH see data sheets size 500+ (ERVM, etc.)

Hydraulic schematics



Dimensional drawing



**Single subplates EAP for 3/3-valve
(in-line mounting)**

Threaded connection Dim. G* ["]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	25	0,75	3832511
G 3/8	28	0,95	3832513
G 1/2	34	1,45	3832510

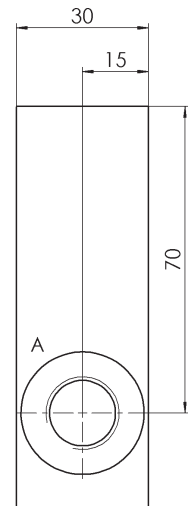
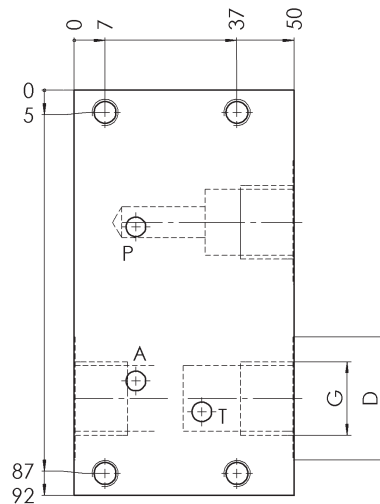
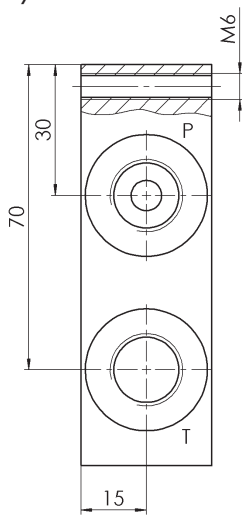
* see drawing below

Hydraulic schematics

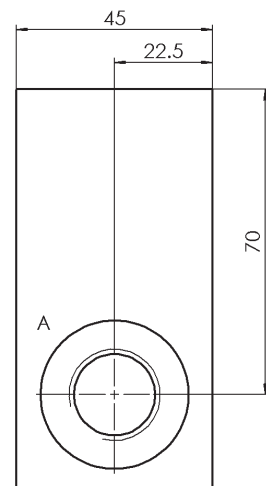
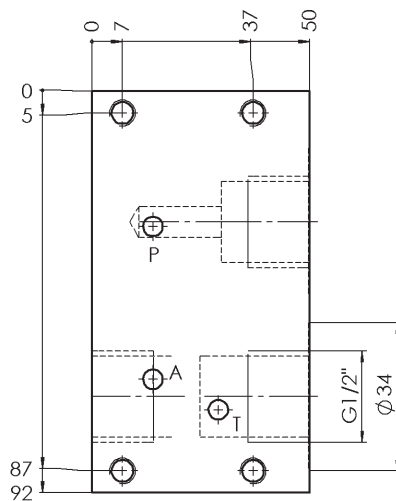
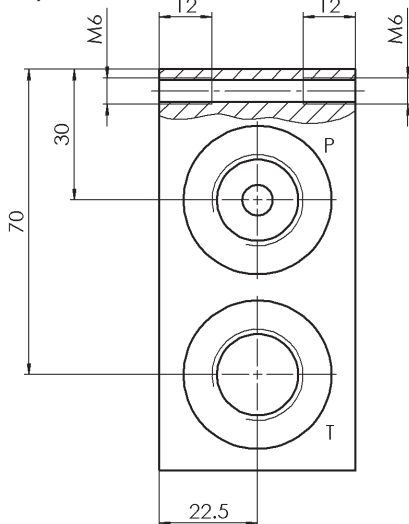


Dimensional drawings

G 3/8" and G 1/4"



G 1/2"



Product information Function 4/3

Functions E, H and J

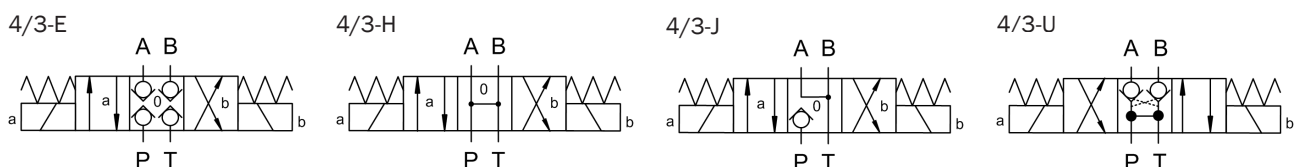
Actuator type	Weight ca. [kg]	Part No. 4/3-E	Part No. 4/3-H	Part No. 4/3-J
Solenoid 24 VDC	1,90	3832536	3832553	3832544
Solenoid 110 VAC	1,90	3832537	3832565	3832545
Solenoid 230 VAC	1,90	3832538	3832566	3832546
Manual lever/spring returned (lateral)	1,85	3832539	3832567	3832547
Manual lever/spring returned (lengthwise)	1,85	3839885	3839887	3839889
Manual lever/with detent (lateral)	1,85	3832540	3832568	3832548
Manual lever/with detent (lengthwise)	1,85	3839886	3839888	3839890
Pneumatic	1,85	3832541	3832569	3832549
Hydraulic	1,85	3832542	3832570	3832551
Pin	1,85	3832543	3832571	3832552
Roller	1,85	3840736	3840737	3840738

Function U

Actuator type	Weight ca. [kg]	Part No. Valve bank	Part No. In-line mounting
Solenoid 24 VDC	3,65	3832572	3856381
Solenoid 110 VAC	3,65	3832573	3856396
Solenoid 230 VAC	3,65	3832574	3856397
Manual lever/spring returned (lateral)	3,60	3832575	3856398
Manual lever/spring returned (lengthwise)	3,60	3839891	3856400
Manual lever/with detent (lateral)	3,60	3832577	3856401
Manual lever/with detent (lengthwise)	3,60	3839892	3856402
Pneumatic	3,60	3832578	3856403
Hydraulic	3,60	3832579	3856404
Pin	3,60	3832580	3856405
Roller	3,60	3840739	3856406

Note: characteristics see page 21 / technical data actuators see pages 22-24

Hydraulic schematics



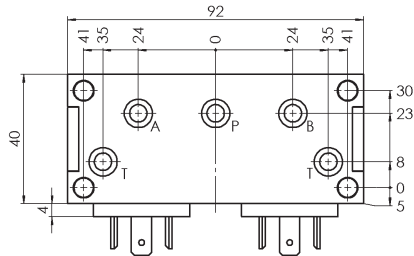
Important: Do not energize solenoids simultaneously!

Type WVM-4B

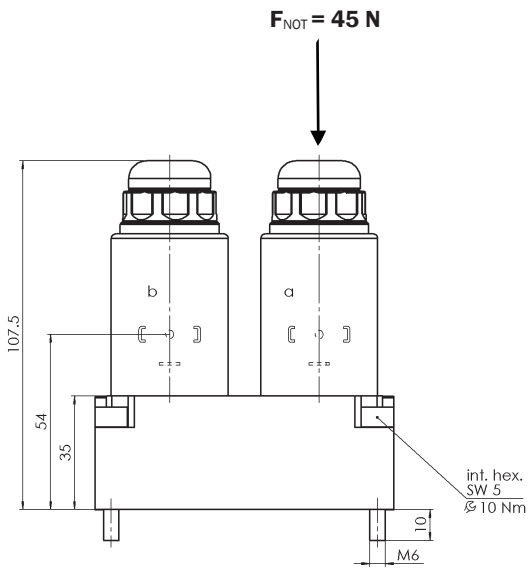
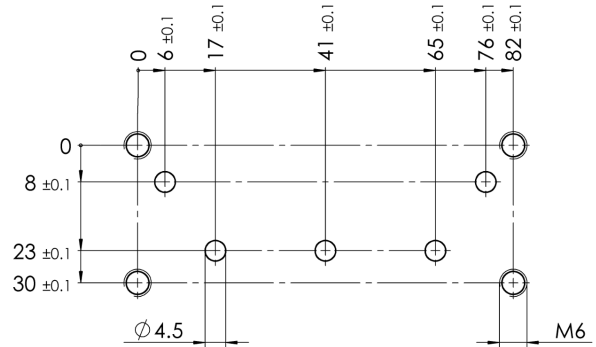
NG 4
up to 12 l/min

Dimensional drawings (solenoid operated)

Functions E, H and J

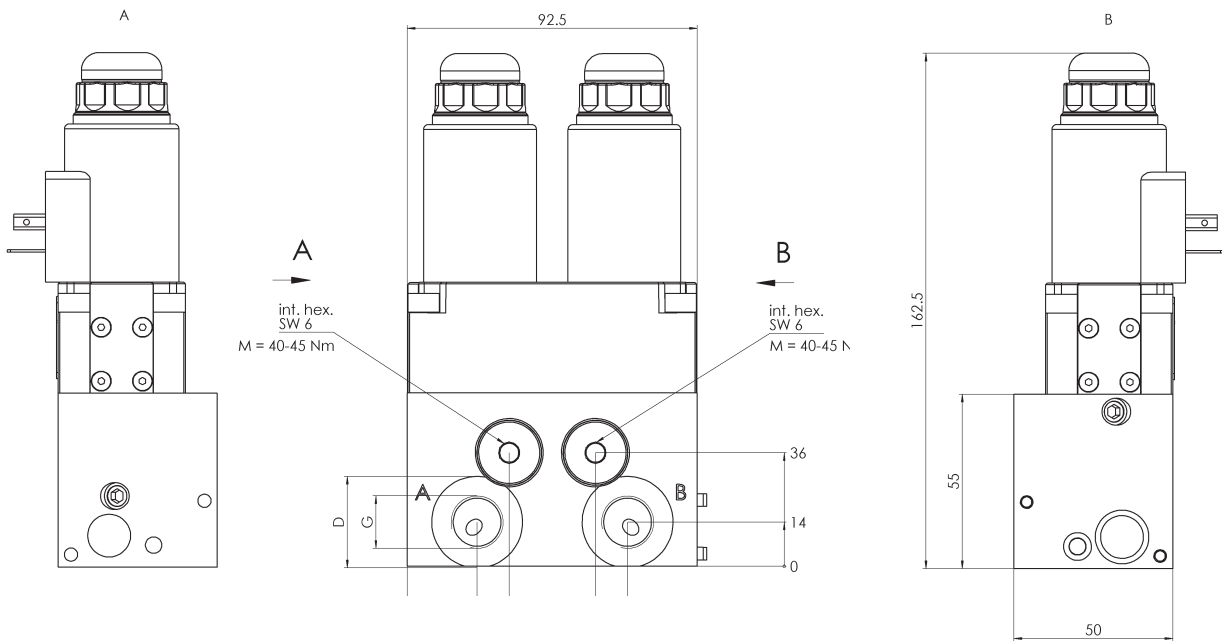


Pattern of drilling for 4/3-valve

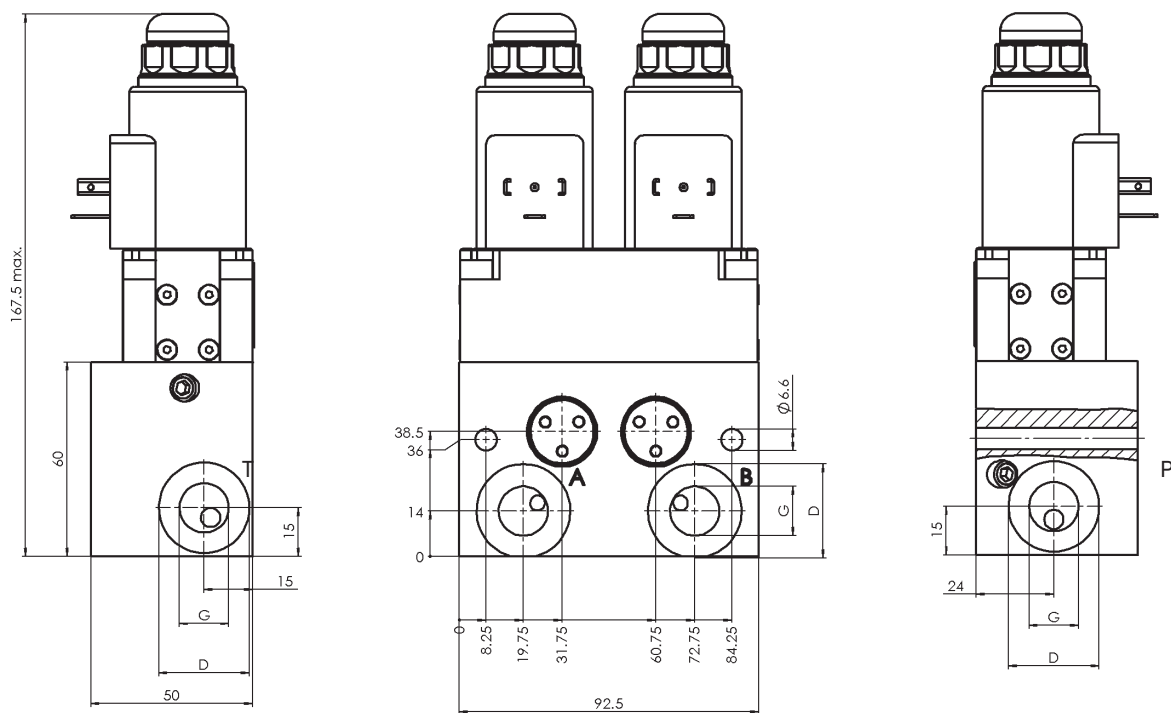


Functions U

Valve bank (Subplate APH already integrated)



In-line body



**Subplates APH for 4/3-valve (functions E, H and J)
(valve bank - example see page 20)**

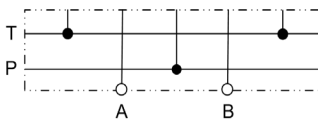
Threaded connection Dim. G* ["]	Dim. H [mm]	Dim. D Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	15	25	0,35	3832581
G 3/8	14	28	0,35	3832582

* see drawing below

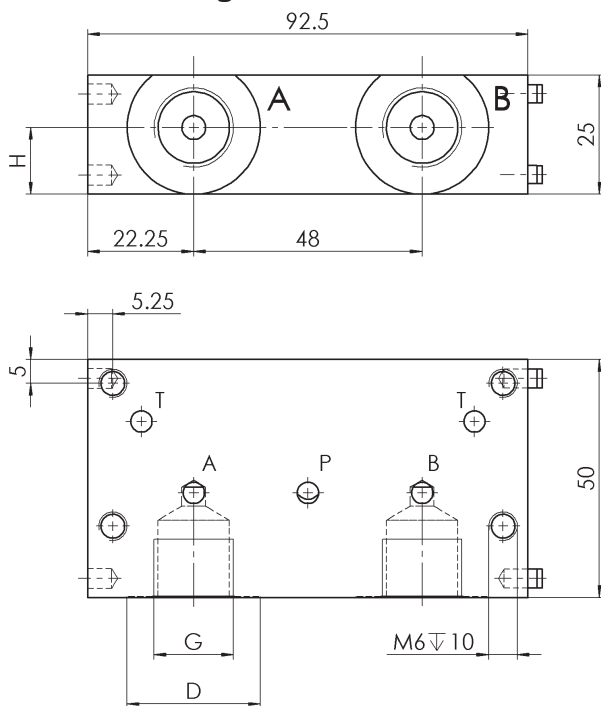
Attention: Mounting elements for APH have to be ordered separately (see pages 19-20)!

Note: For additional functions in subplates APH see data sheets size 500+ (ERVM, etc.)

Hydraulic schematics



Dimensional drawing



**Single subplates EAP for 4/3-valve
(in-line mounting)**

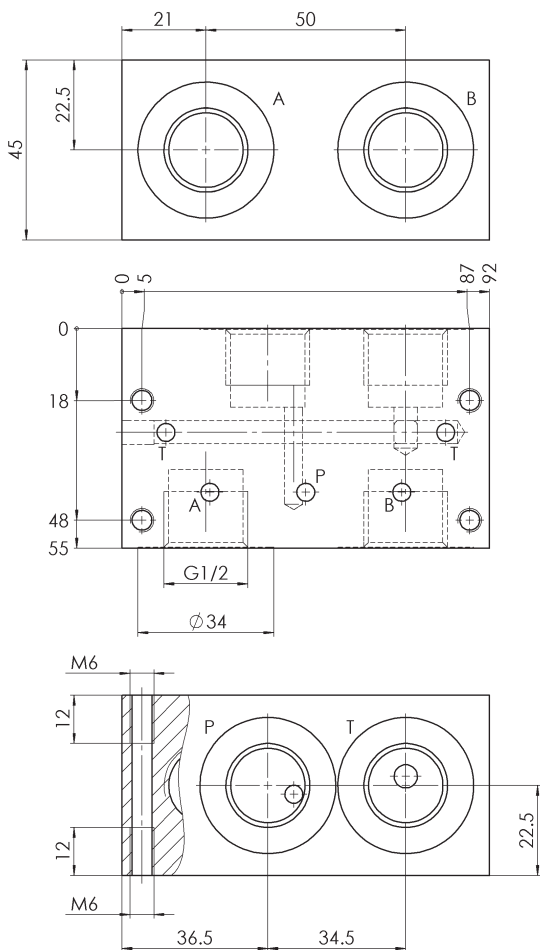
Threaded connection Dim. G ["]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	25	0,95	3832605
G 3/8	28	0,95	3832607
G 1/2	34	1,55	3832583

Hydraulic schematics

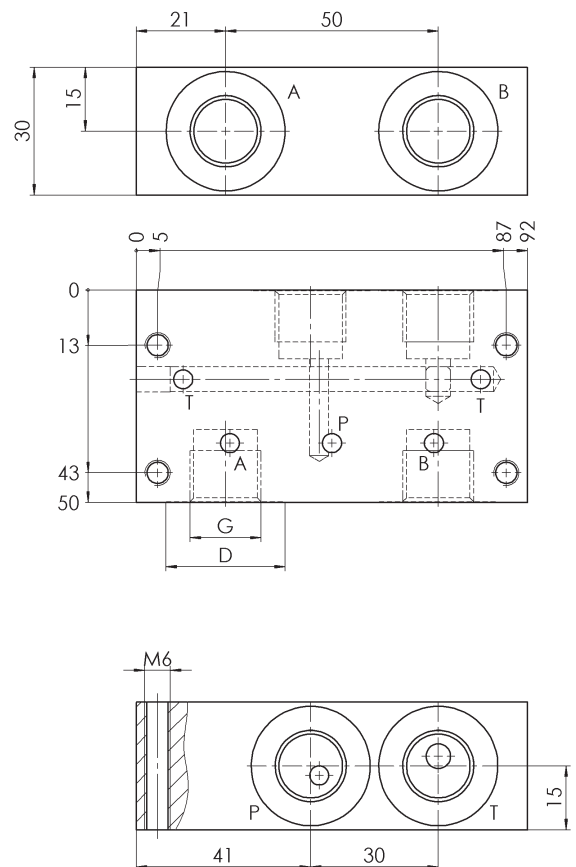


Dimensional drawings

G 1/2"



G 1/4" and G 3/8"



Type WVM-4B

NG 4
up to 12 l/min

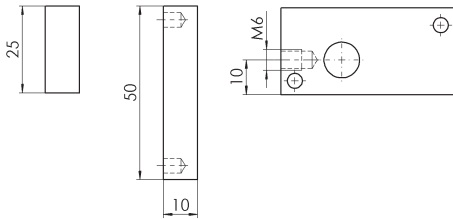
Valve bank (example see following page)

Mounting elements to subplates APH

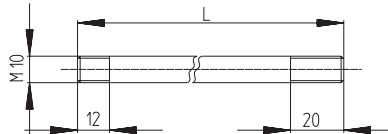
Item description	Dimensions	Weight ca. [kg]	Part No.
Subplate „starting block“ / without connection for DV	see dimensional drawing	0,30	3845391
End plate	see dimensional drawing	0,10	3845392
Tie bolt	see dimensional table	see dimensional table	see dimensional table
Cap nut	see dimensional drawing	-	4006548
Usit-ring	10,35 x 16 x 2 mm	-	6116776

Note: For additional controlfunctions in subplate „starting block“ see data sheets size 500+ (DVM, AVM, etc.)

End plate



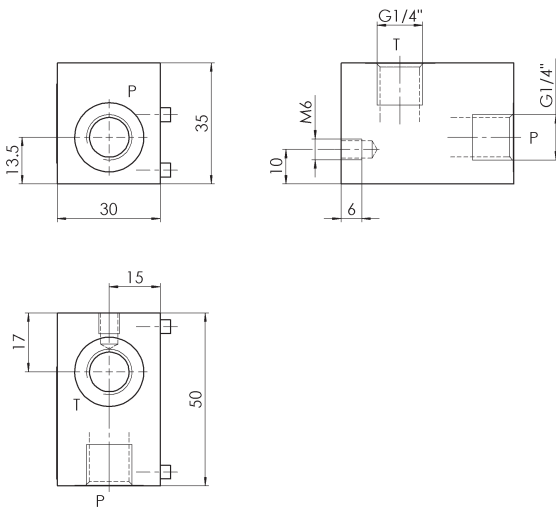
Tie bolt



Dimensional drawings

Subplate „starting block“ / without connection for pressure relief valve

„Starting block“ with pressure relief: see data sheet page 4!
„Starting block“ is always required!

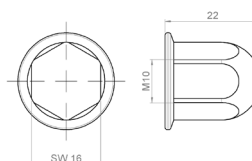


Dimensional table tie bolts

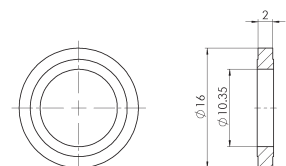
Number of sections [section length = 46 mm]	Length [mm]	Part No.	Weight ca. [kg]
1	80,5	3688992	0,05
2	126,5	3689281	0,08
3	172,5	3689283	0,10
4	218,5	3689284	0,13
5	264,5	3689295	0,16
6	310,5	3689296	0,20
7	356,5	3689297	0,22
8	402,5	3689299	0,25
9	448,0	3689300	0,28
10	494,0	3689302	0,31

Note: Tie bolt need a special length when an end plate with a shut-off valve will be assembled (see data sheet AVM page 4)!
3/3- and 4/3-valves count as double sections!

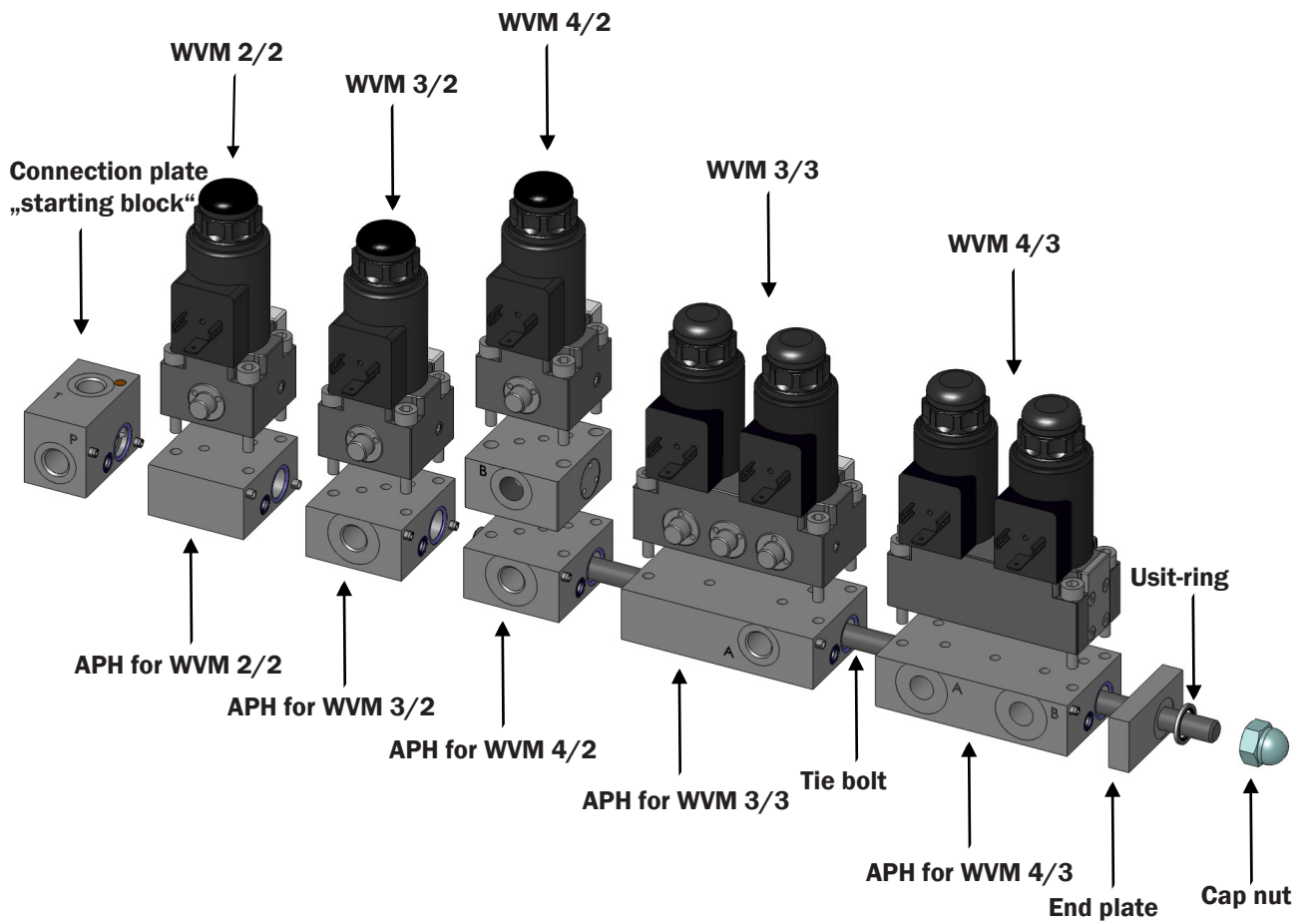
Cap nut



Usit-ring

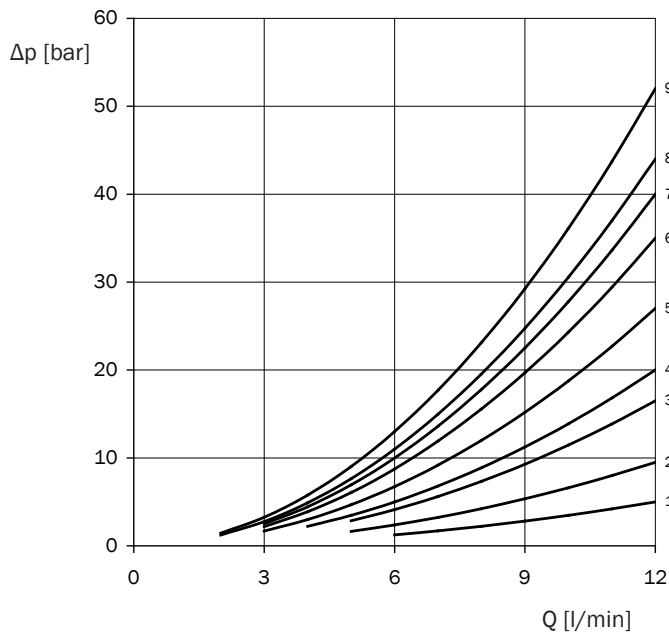


Example valve bank



Characteristics

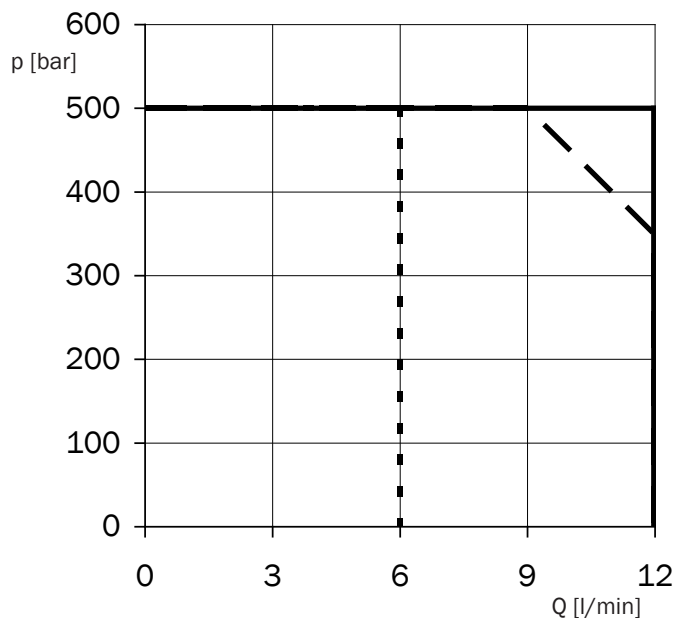
Pressure drop



Function	P - A	P - B	A - T	B - T	P - T
4/2-C	8	6	9	8	
4/2-D	8	8	8	9	
4/3-E	5	5	3	3	
4/3-J	9	9	3 (9)	3 (9)	
4/3-H	2	2	2	2	1
4/3-U	5	5	4	4	(1)
3/3-K	8		5		
3/2-L	7		9		
3/2-N	6		7		
2/2-WO					3
2/2-WS					5

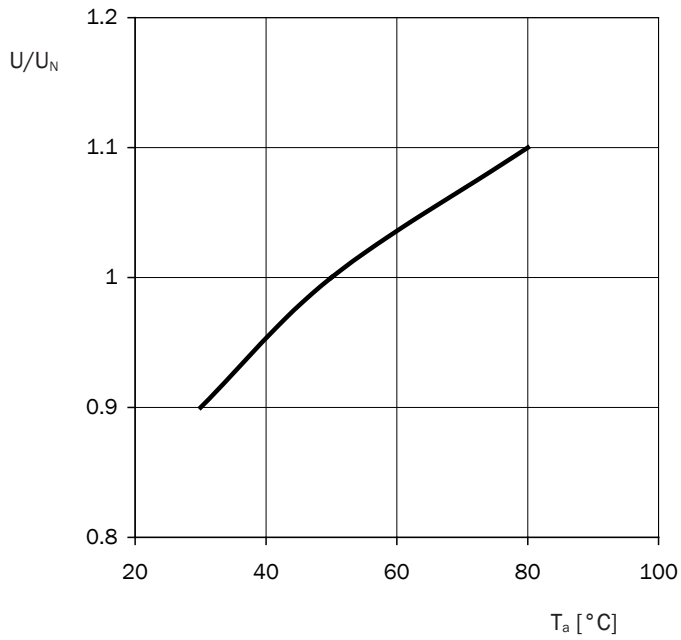
() = for neutral position

Hydraulic operating powerlimits



Hydraulic operating powerlimits at rated voltage and ambient temperature $T_a = 50^\circ \text{C}$.

— E, J
— C, D, K, L, N, WO, H, U
- - WS

Applied voltage

Applied voltage for achievement of the hydraulic operation at deviating ambient temperatures.

Type WVM-4B
NG 4 up to 12 l/min

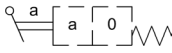
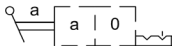
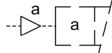

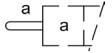
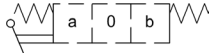
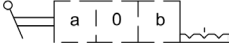
Actuators

Technical data

Manual lever / spring returned (HF)	The actuator force presses a pin. (spring return by pin springs and return spring) Leverage forche: 15 - 25 N Movement angle: see dimensional drawing Motion on the lever: see dimensional drawing
Manual lever / with detent (HR)	The actuator force presses a pin. Spring return by spin springs. Leverage: 15 - 25 N Movement angle: see dimensional drawing Motion on the lever: see dimensional drawing
pneumatic / air operated (AIR)	A single acting air pressure loaded piston with spring return loads the actuator. Piston is leakage free. Threaded port: G1/8" Min. pilot pressure: 3 bar Max. pilot pressure: 8 bar
hydraulic / oil operated (OIL)	A single acting air pressure loaded piston with spring return loads the actuator. Piston is leakage free. Threaded port: G1/8" Min. pilot pressure: 11 bar Max. pilot pressure: 700 bar
Pin / mechanical (TS)	The moving force transferred by a pin with spring return. Moving force: 100 N Stroke: 4,2 mm
Roller / mechanical (TR)	Technical data on request

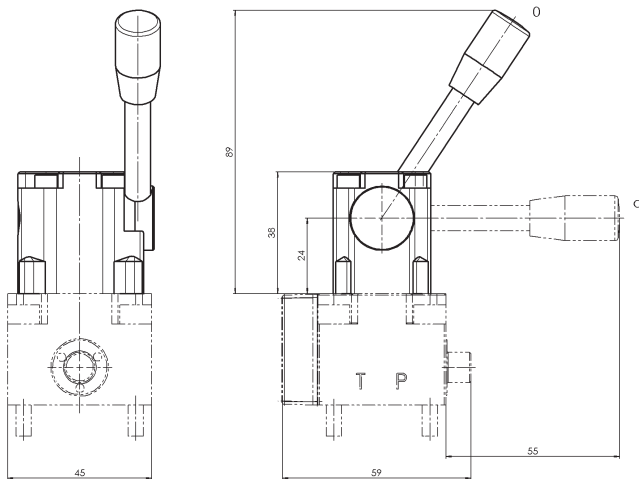
Note: Technical data for solenoids see page 1

Hydraulic schematics

Manual lever spring returned	Manual lever with detent	Pneumatic	Hydraulic	Pin	Roller
with 2 positions 	with 2 positions 				schematic on request
with 3 positions 	with 3 positions 				

Dimensional drawings

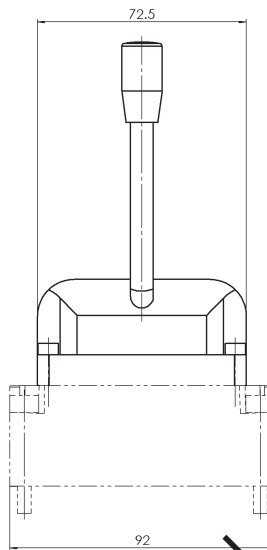
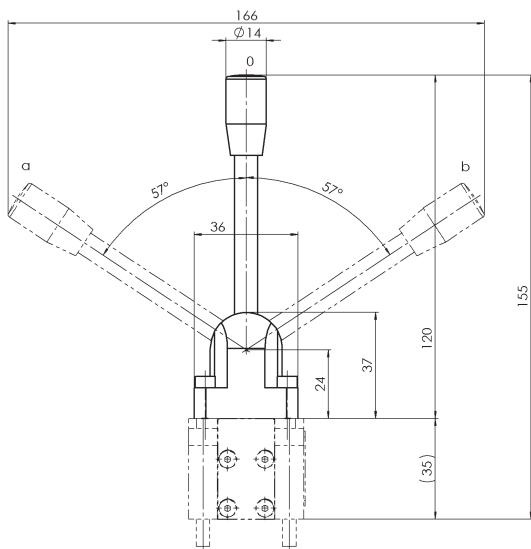
Manual lever for 2/2-, 3/2- and 4/2-valve
spring return or with detent



Manual levers for 3/3- and 4/3-valve
spring return or with detent

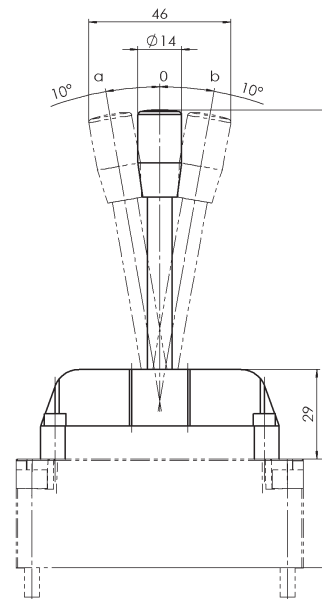
Version „lateral“

(in combination preferably with APH plates for valve banks)



Version „lengthwise“

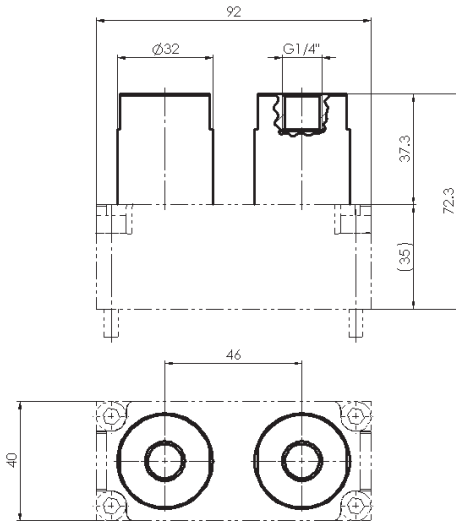
(in combination preferably with EAP plates for stand-alone valves)



Type WVM-4B

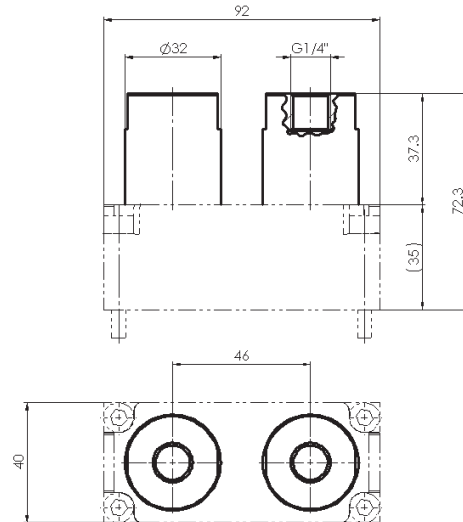
NG 4
up to 12 l/min

Pneumatic (all valve types)



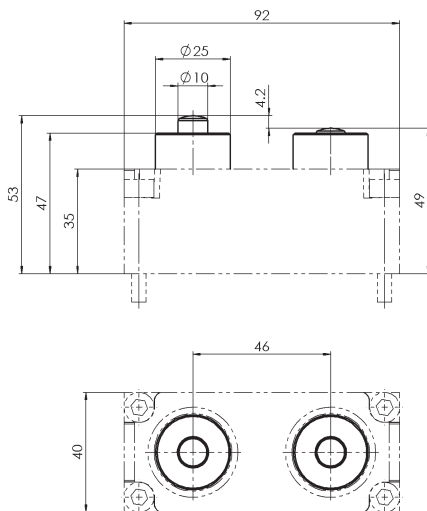
(Illustration for 3/3- or 4/3-valve)

Hydraulic (all valve types)



(Illustration for 3/3- or 4/3-valve)

Pin (all valve types)



(Illustration for 3/3- or 4/3-valve)
Do not operate both pins simultaneously!

Roller (all valve types)

Dimension drawing on request