

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/(lengthwise*)																	
	HR(Q*/L*)		manual lever/with detent (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																			

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

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

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

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)

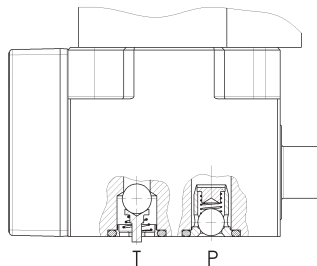
Desing revision
Capital letters A-Z; identical letters equal same connecting dimensions

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

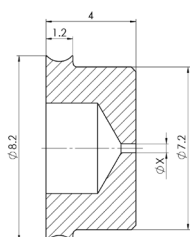
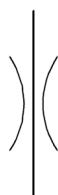
Description		Part.-No.	Solenoid	Part No.
5 pcs.	O-Ring, 5 x 1,5 mm, FPM	3853409	Solenoid 24 VDC	3546095
5 pcs.	O-Ring, 8 x 1,5 mm, FPM		Solenoid 110 VAC	3547372
4 pcs.	Fixing screw, M6 x 35 mm		Solenoid 230 VAC	3547373
4 pcs.	Fixing screw, M6 x 60 mm		Plastic nut	4006061
1 pce.	Seal cover plate for port B		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



Type	Valve type	Item description	Part No.
Einsteckblende Ø 0,4	All types	Einsteckblende für T	4002279
Einsteckblende Ø 0,5	All types	Einsteckblende für T	4002353
Einsteckblende Ø 0,6	All types	Einsteckblende für T	4002354
Einsteckblende Ø 0,7	All types	Einsteckblende für T	4002355
Einsteckblende Ø 0,8	All types	Einsteckblende für T	4002356
Einsteckblende Ø 1,0	All types	Einsteckblende für T	4002357

Dimensional drawing**Hydraulic schematics**

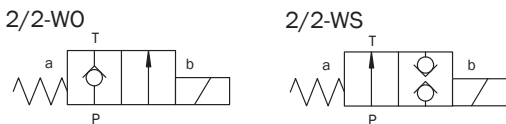
Product information 2/2-valve

Functions WO and WS

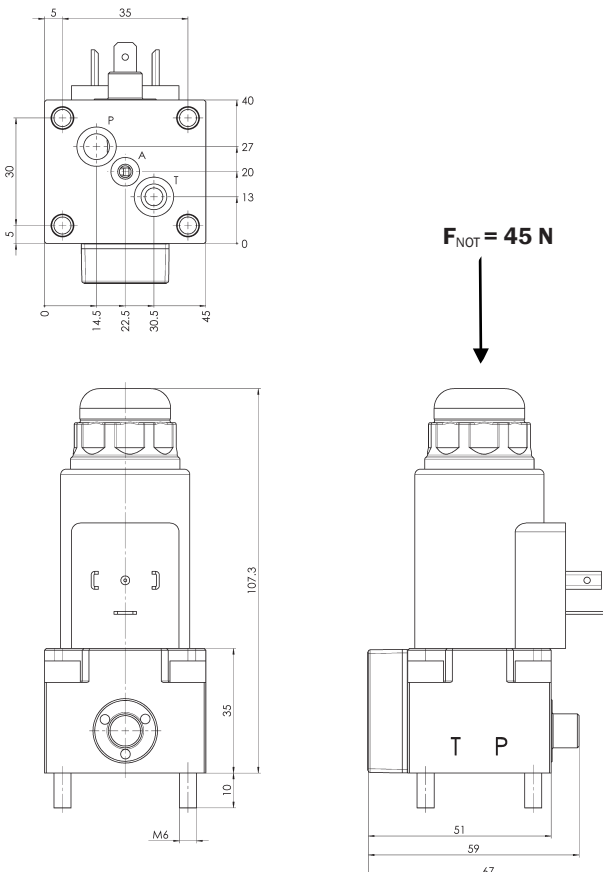
Actuator type	Weight ca. [kg]	Part No. 2/2-WO	Weight ca. [kg]	Part No. 2/2-WS
Solenoid 24 VDC	0,85	3832384	0,85	3832434
Solenoid 110 VAC	0,85	3832426	0,85	3832448
Solenoid 230 VAC	0,85	3832427	0,85	3832449
Manual lever / spring returned	0,80	on request	0,80	on request
Pneumatic	0,80	on request	0,80	on request
Hydraulic	0,80	on request	0,80	on request
Pin	0,80	on request	0,80	on request
Roller	0,80	on request	0,80	on request

Note: Characteristics see pages 24-25

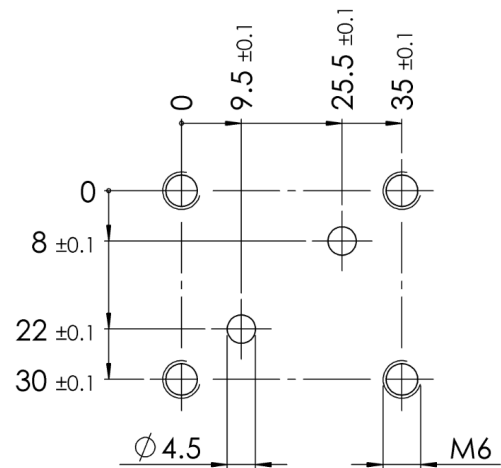
Hydraulic schematics



Dimensional drawing (solenoid operated)



Pattern of drilling for 2/2-valve



**Subplates APH for 2/2-valve
(valve bank - example see page 23)**

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

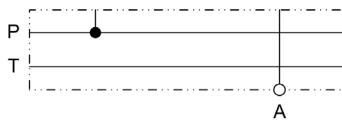
* see drawings below

Attention: Mounting elements for APH have to be ordered seperately (see page 22)!

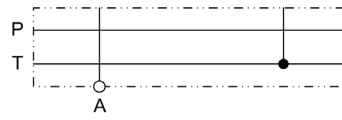
Note: For additional functions in subplates APH see data sheets size 500+ (ERVM, etc.)

Hydraulic schematics

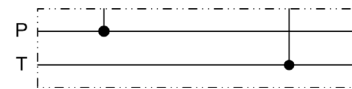
P - A



A - T

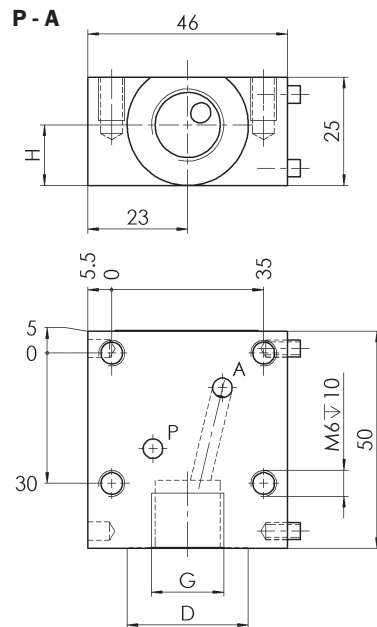


P - T

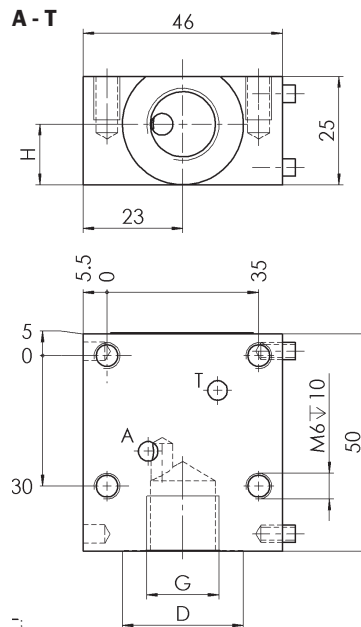


Dimensional drawings

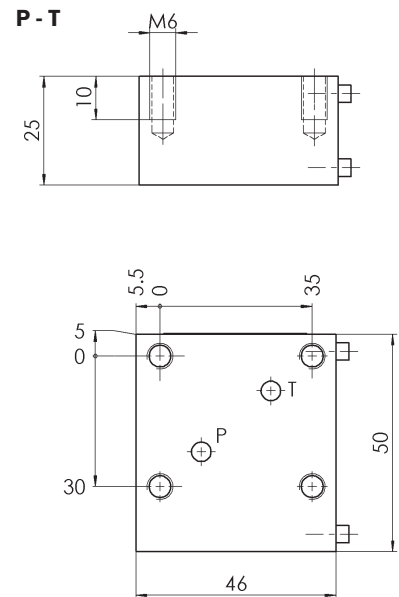
P - A



A - T



P - T



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

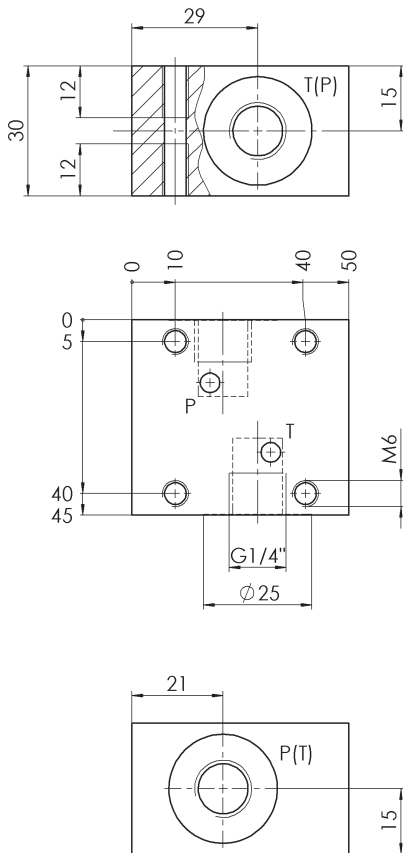
Threaded connection Dim. G ["]	Weight ca. [kg]	Part No.
G 1/4	0,45	3763413
G 3/8	0,45	3807978
G 1/2	0,75	3832462

Hydraulic schematics

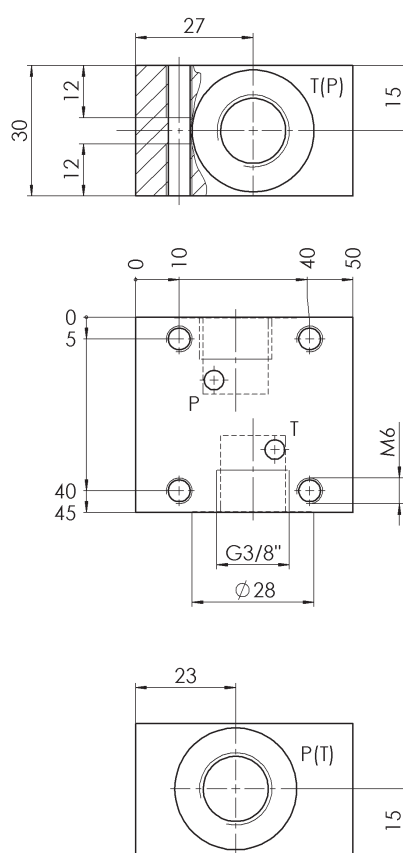


Dimensional drawings

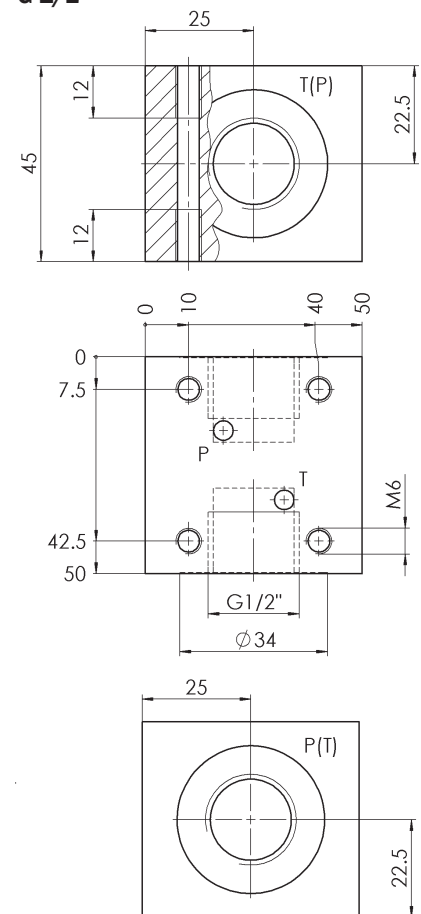
G 1/4"



G 3/8"



G 1/2"



Type WVM-4B

NG 4
up to 12 l/min

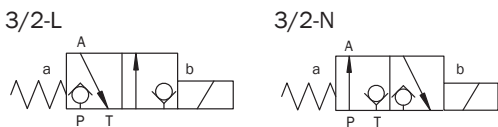
Product information 3/2-valve

Functions L and N (negative overlap*)

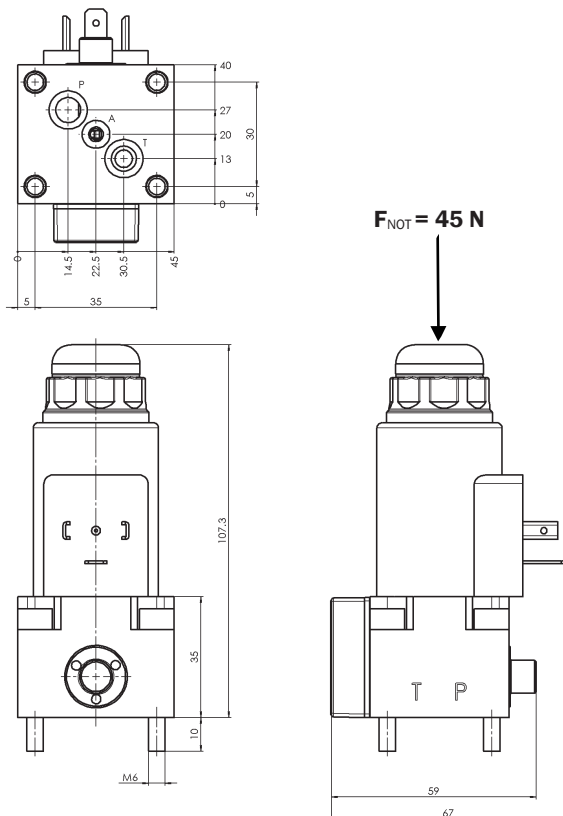
Actuator type	Weight ca. [kg]	Part No. 3/2-L	Weight ca. [kg]	Part No. 3/2-N
Solenoid 24 VDC	0,85	3832477	0,85	3832485
Solenoid 110 VAC	0,85	3832478	0,85	3832487
Solenoid 230 VAC	0,85	3832479	0,85	3832488
Manual lever / spring returned	0,80	on request	0,80	on request
Pneumatic	0,80	on request	0,80	3832491
Hydraulic	0,80	3832483	0,80	3832492
Pin	0,80	on request	0,80	3832494
Roller	0,80	3840729	0,80	on request

Note: Characteristics see pages 24-25

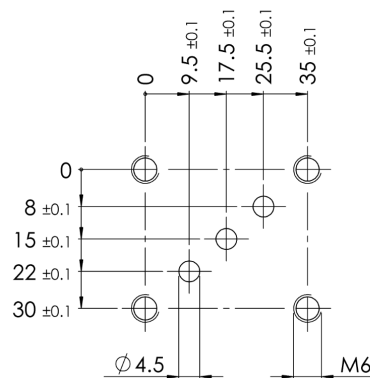
Hydraulic schematics



Dimensional drawing (solenoid operated)



Pattern of drilling for 3/2-valve



Subplates APH for 3/2-valve (valve bank - example see page 23)

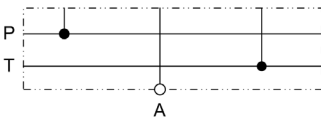
Threaded connection Dim. G* ["]	Dim. H* [mm]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	15	25	0,35	3832495
G 3/8	14	28	0,35	3832496

* see drawing below

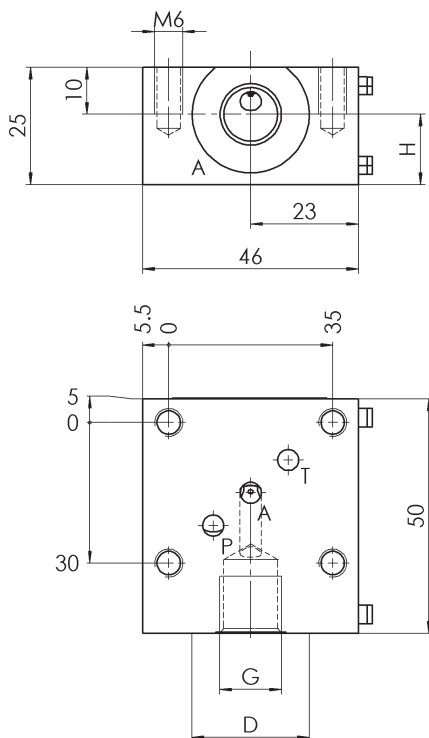
Attention: Mounting elements for APH have to be ordered separately (see page 22)!

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

Hydraulic schematics



Dimensional drawing



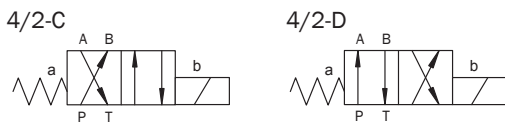
Product information 4/2-valve

Functions C and D (negative overlap)

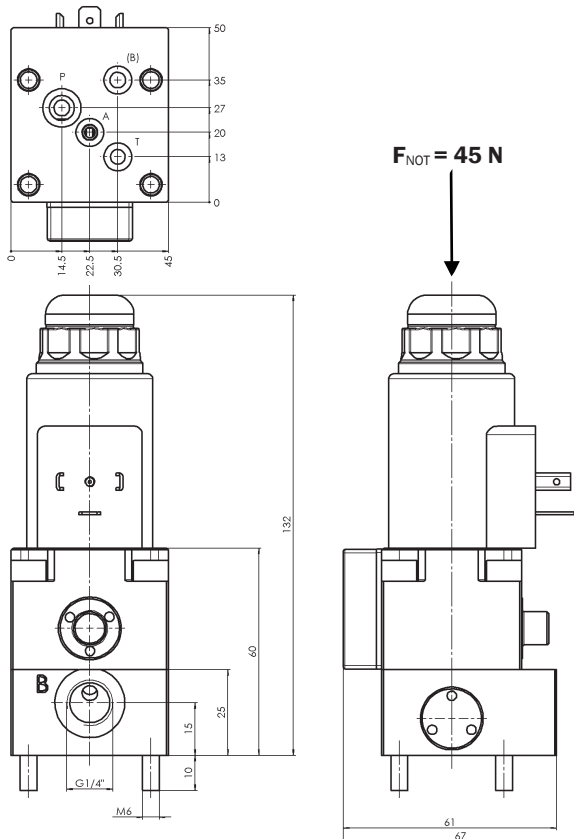
Actuator type	Weight ca. [kg]	Part No. 4/2-C	Weight ca. [kg]	Part No. 4/2-D
Solenoid 24 VDC	1,20	3832514	1,20	3832522
Solenoid 110 VAC	1,20	3832515	1,20	3832523
Solenoid 230 VAC	1,20	3832516	1,20	3832524
Manual lever / spring returned	1,15	on request	1,15	on request
Pneumatic	1,15	on request	1,15	on request
Hydraulic	1,15	on request	1,15	on request
Pin	1,15	on request	1,15	on request
Roller	1,15	on request	1,15	on request

Note: Characteristics see pages 24-25

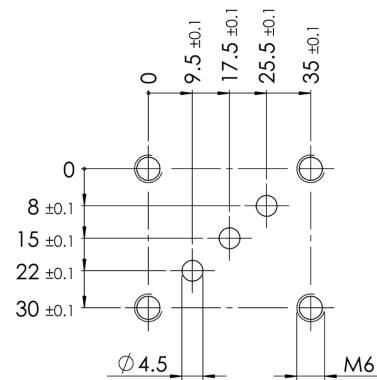
Hydraulic schematics



Dimensional drawing (solenoid operated)



Pattern of drilling for 4/2-valve



Seal cover plate (see spare parts set page 4) 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 23)

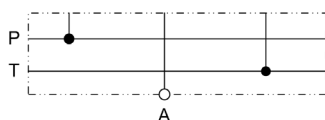
Threaded connection Dim. G* ["]	Dim. H* [mm]	Dim. D* Ø [mm]	Weight [kg]	Part No.
G 1/4	15	25	0,35	3832530
G 3/8	14	28	0,35	3832532

* see drawing below

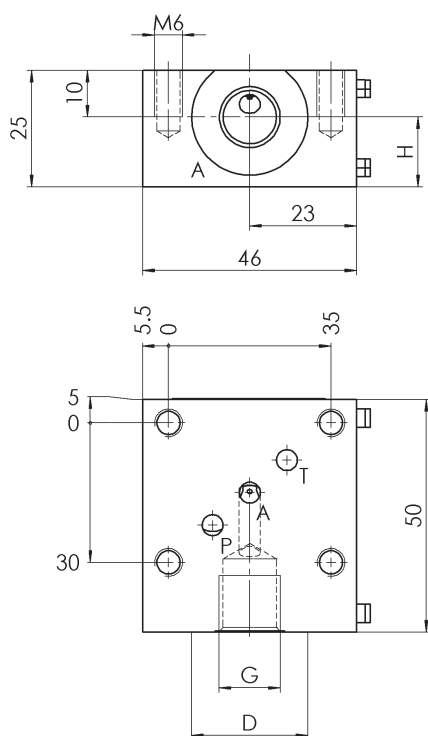
Attention: Mounting elements for APH have to be ordered seperately (see page 22)!

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)**

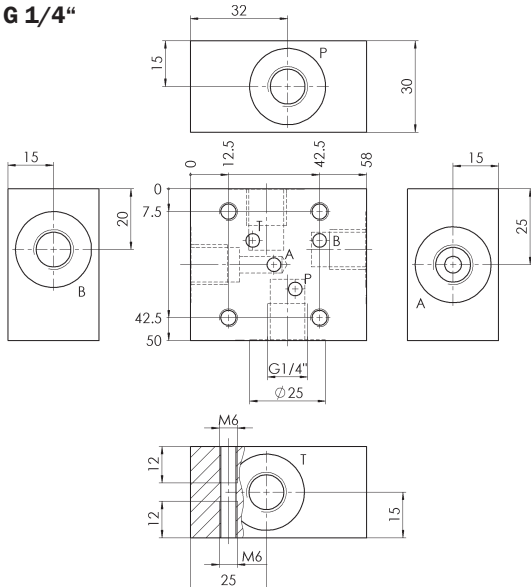
Threaded connection Dim. G ["]	Weight ca. [kg]	Part No.
G 1/4	0,45	3832534
G 3/8	0,45	3832535
G 1/2	0,70	3832533

Hydraulic schematics

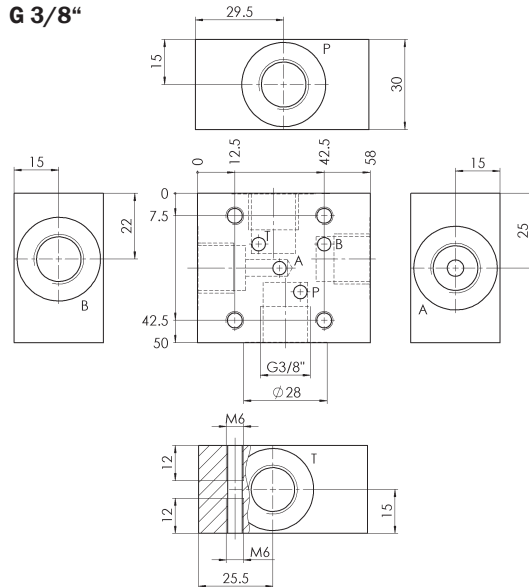


Dimensional drawings

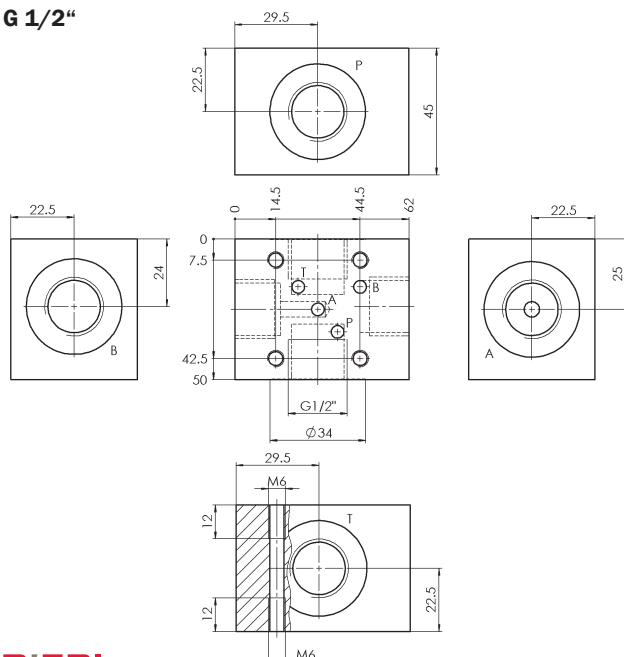
G 1/4"



G 3/8"



G 1/2"



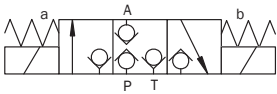
Product information 3/3-valve

Function K

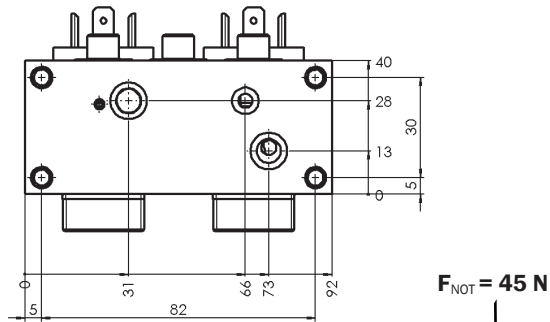
Actuator type	Weight ca. [kg]	Part No. 3/3-K
Solenoid 24 VDC	1,75	3832500
Solenoid 110 VAC	1,75	3832501
Solenoid 230 VAC	1,75	3832502
Manual lever/spring returned (lengthwise)	1,70	3839873
Manual lever/with detent (lengthwise)	1,70	on request
Pneumatic	1,70	on request
Hydraulic	1,70	on request
Pin	1,70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

Note: Characteristics see pages 24-25

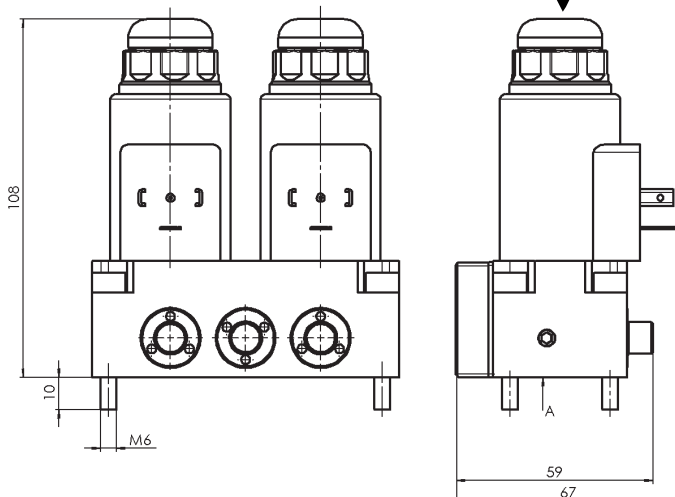
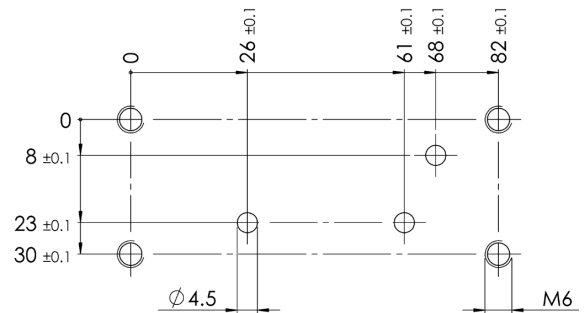
Hydraulic schematic



Dimensional drawing (solenoid operated)



Pattern of drilling for 3/3-valve



Subplates APH for 3/3-valve (valve bank - example see page 23)

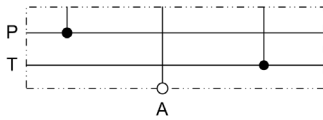
Threaded connection Dim. G* ["]	Dim. H* [mm]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	15	25	0,75	3832508
G 3/8	14	28	0,75	3832509

* see drawing below

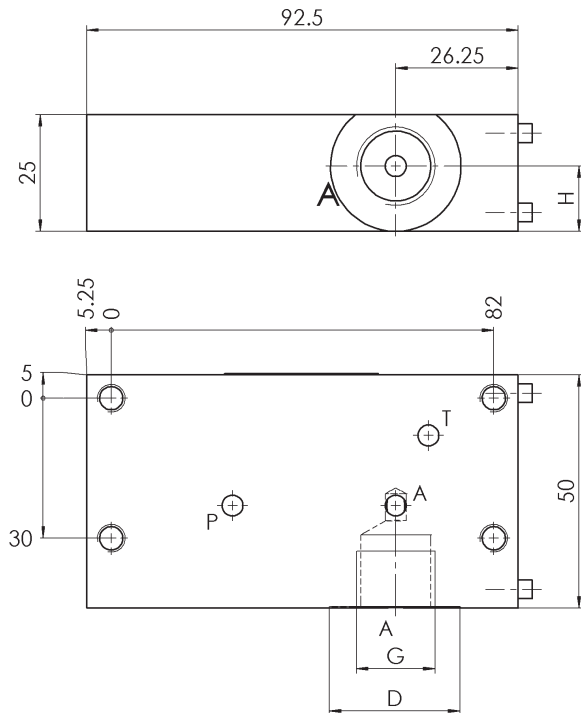
Attention: Mounting elements for APH have to be ordered separately (see page 22)!

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

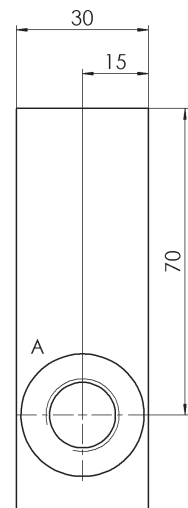
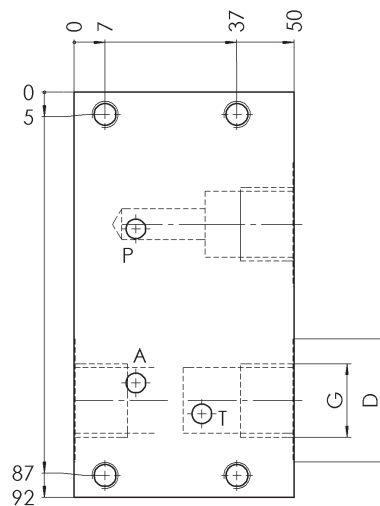
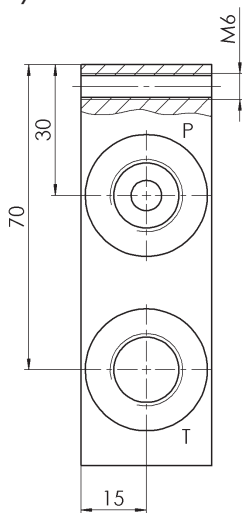
* see drawing below

Hydraulic schematics

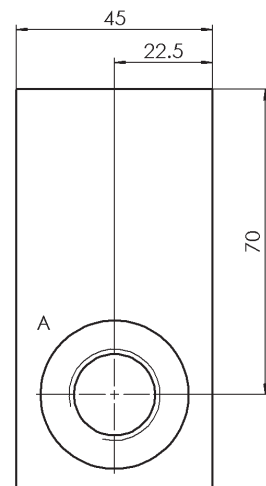
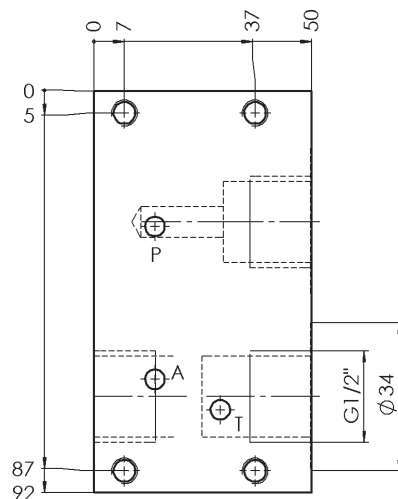
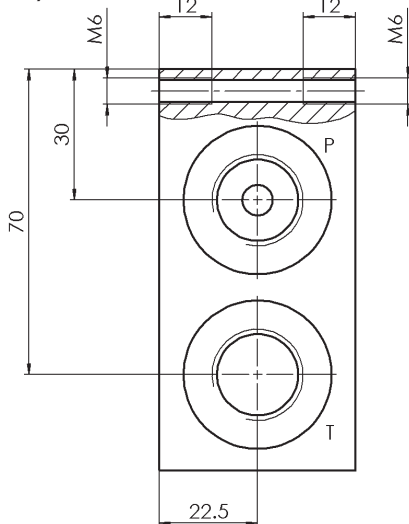


Dimensional drawings

G 3/8" and G 1/4"



G 1/2"



Product information Function 4/3

Functions E, H and J

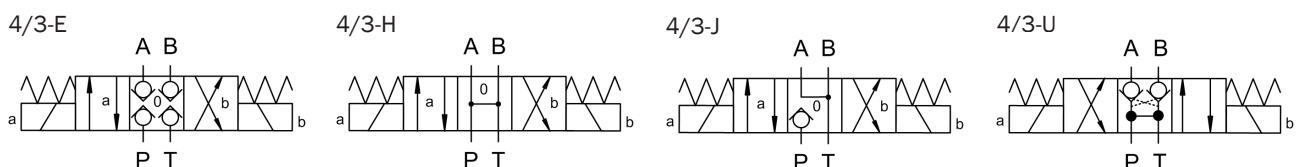
Actuator type	Weight ca.[kg]	Part No. 4/3-E	Part No. 4/3-H	Part No. 4/3-J
Solenoid 24 VDC	1,90	3832536	3832553	3832544
Solenoid 110 VAC	1,90	3832537	3832565	3832545
Solenoid 230 VAC	1,90	3832538	3832566	3832546
Manual lever/spring returned (lengthwise)	1,85	3839885	on request	on request
Manual lever/with detent (lengthwise)	1,85	3839886	on request	on request
Pneumatic	1,85	on request	on request	on request
Hydraulic	1,85	on request	on request	on request
Pin	1,85	on request	on request	on request
Roller	1,85	on request	on request	on request

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	4001791
Solenoid 230 VAC	3,65	3832574	3856397
Manual lever/spring returned (lengthwise)	3,60	3839891	4001793
Manual lever/with detent (lengthwise)	3,60	on request	on request
Pneumatic	3,60	on request	on request
Hydraulic	3,60	on request	on request
Pin	3,60	on request	on request
Roller	3,60	on request	on request

Note: characteristics see page 24

Hydraulic schematics



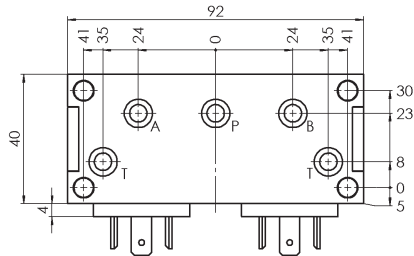
Important: Do not energize solenoids simultaneously!

Type WVM-4B

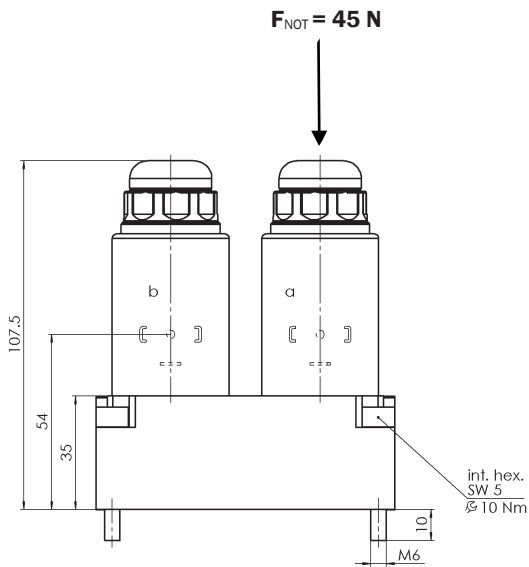
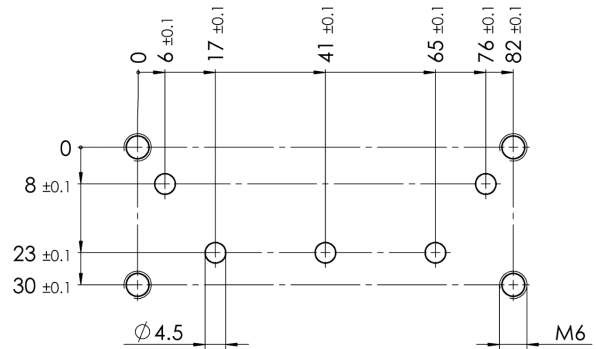
NG 4
up to 12 l/min

Dimensional drawings (solenoid operated)

Functions E, H and J

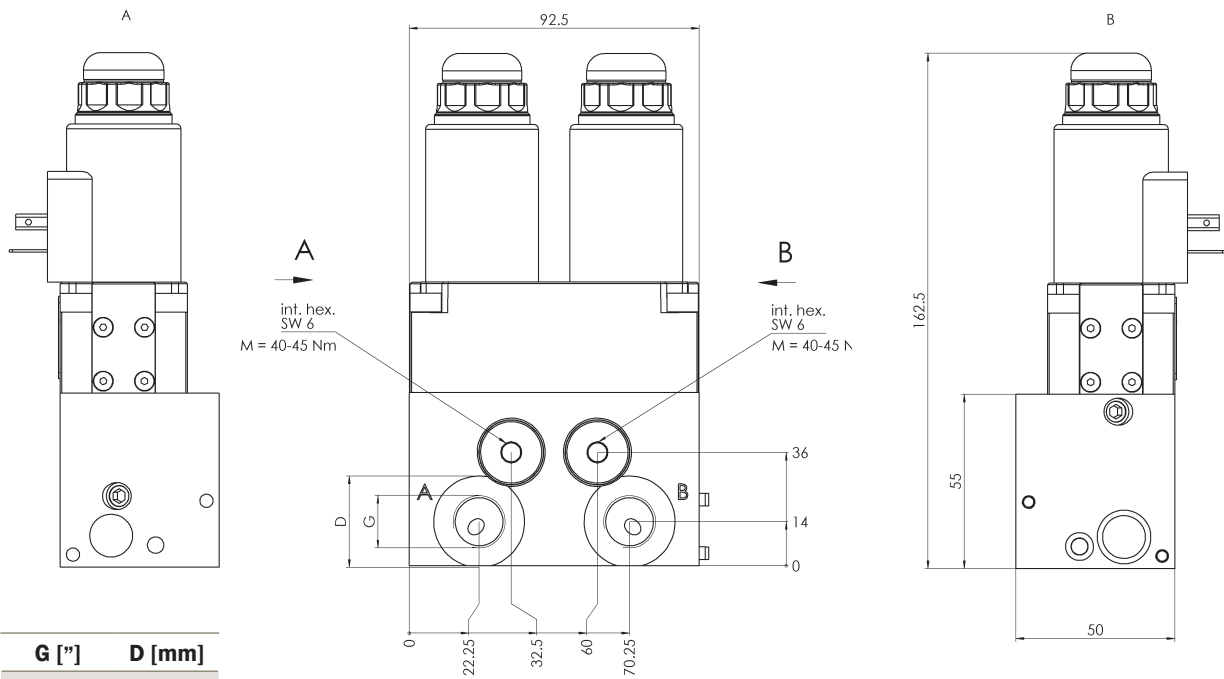


Pattern of drilling for 4/3-valve

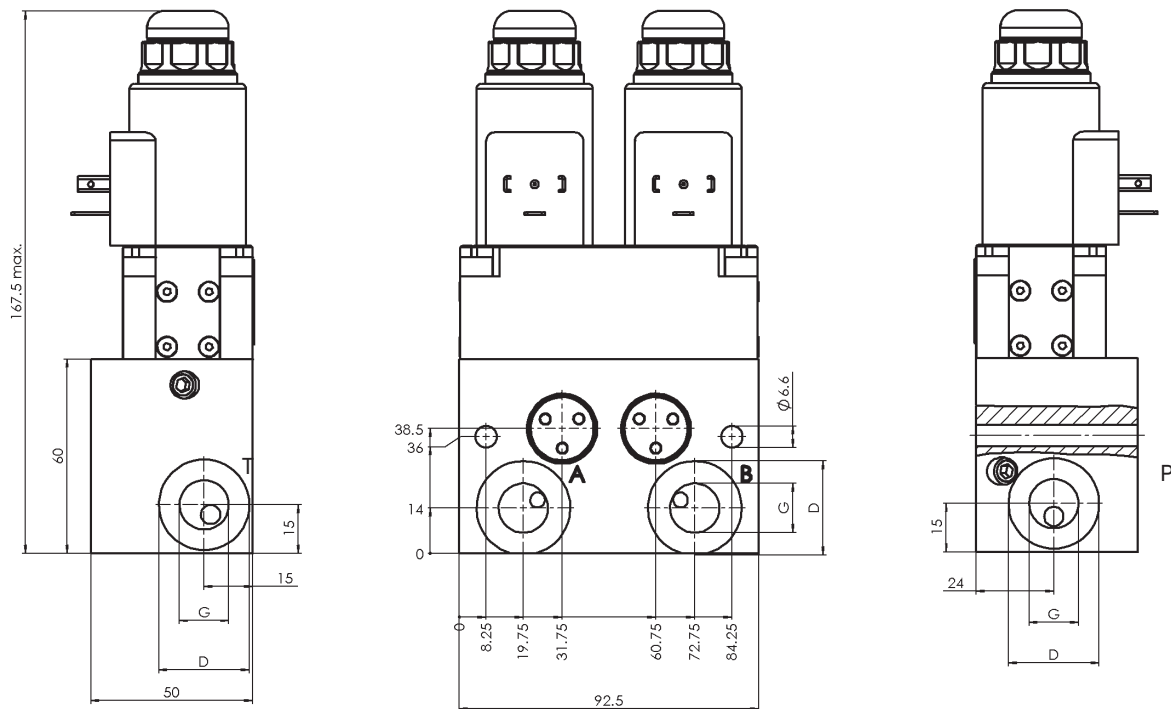


Functions U

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 23)**

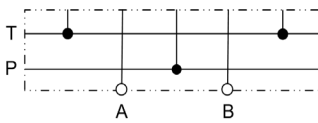
Threaded connection Dim. G* ["]	Dim. H [mm]	Dim. D Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	15	25	0,35	3832581
G 3/8	14	28	0,35	3832582

* see drawing below

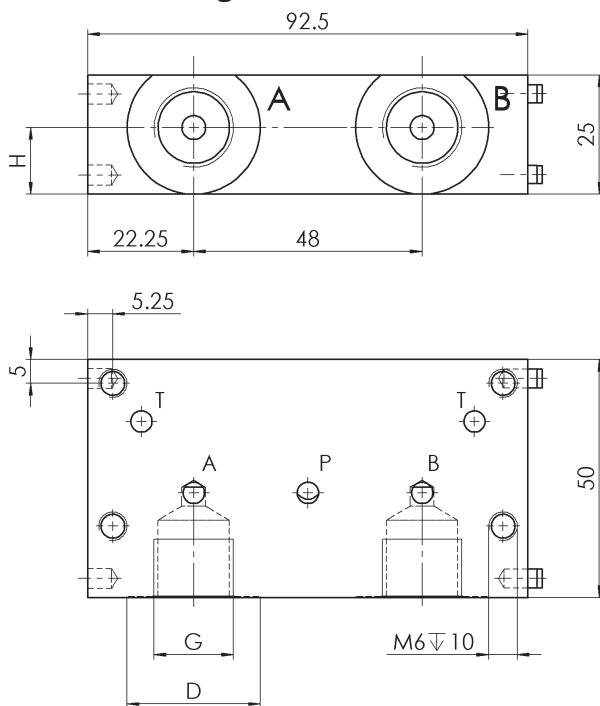
Attention: Mounting elements for APH have to be ordered seperately (see page 22)!

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)**

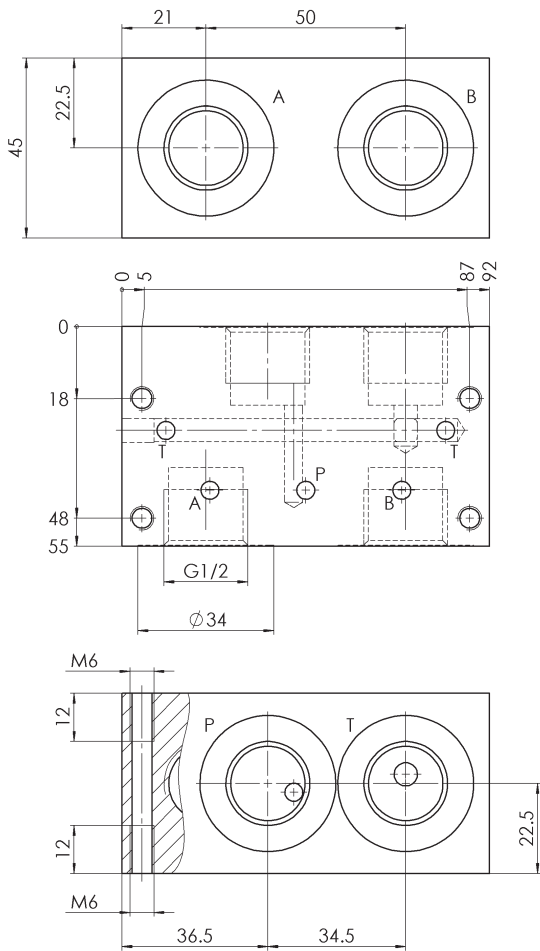
Threaded connection Dim. G ["]	Dim. D* Ø [mm]	Weight ca. [kg]	Part No.
G 1/4	25	0,95	3832605
G 3/8	28	0,95	3832607
G 1/2	34	1,55	3832583

Hydraulic schematics

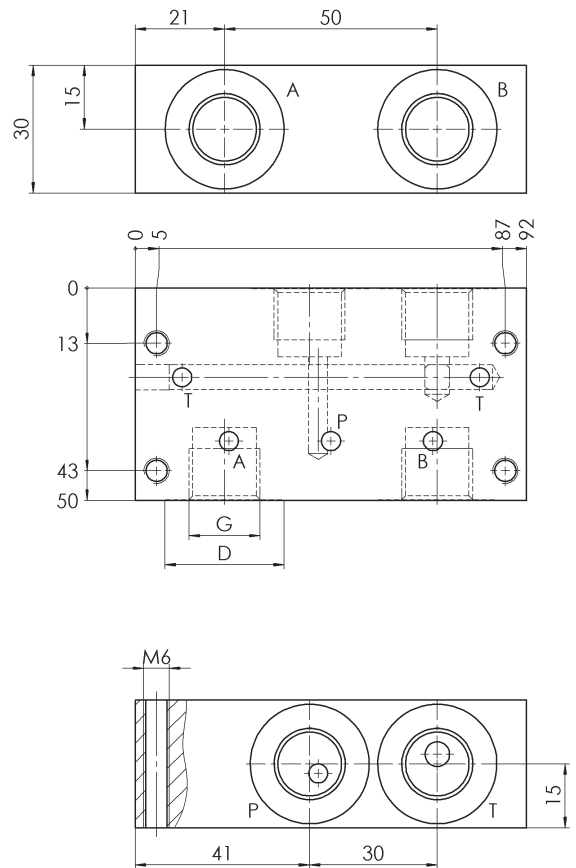


Dimensional drawings

G 1/2"



G 1/4" and G 3/8"



Type WVM-4B

NG 4
up to 12 l/min

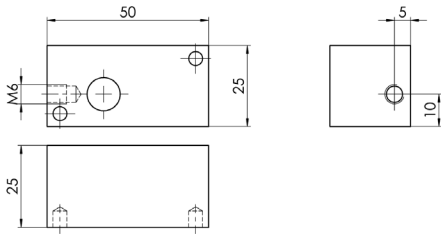
Valve bank (example see following page)

Mounting elements to subplates APH

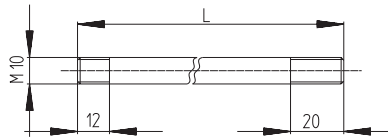
Item description	Dimensions	Weight ca. [kg]	Part No.
End plate	see dimensional drawing	0,10	4133564
Tie bolt	see dimensional table	see dimensional table	see dimensional table
Cap nut	see dimensional drawing	-	4006548
Usit-ring	10,35 x 16 x 2 mm	-	6116776

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

End plate

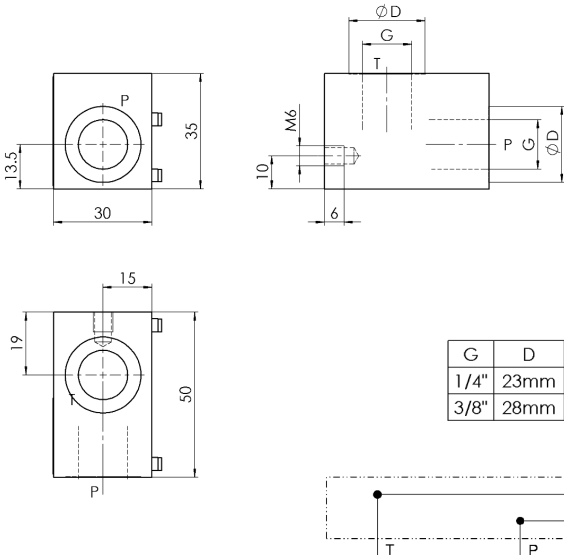


Tie bolt



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!

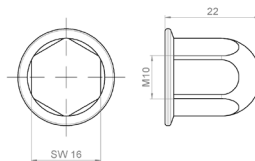


Dimensional table tie bolts

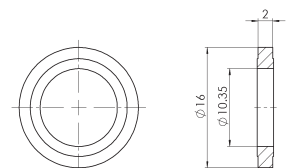
Number of sections [section length = 46 mm]	Length [mm]	Part No.	Weight ca. [kg]
1	101	4133634	0,05
2	147	4133689	0,08
3	193	4133692	0,10
4	239	4133781	0,13
5	285	4133823	0,16
6	331	4133861	0,20
7	377	4133906	0,22
8	423	4133907	0,25
9	469	4133909	0,28
10	515	4133913	0,31

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!

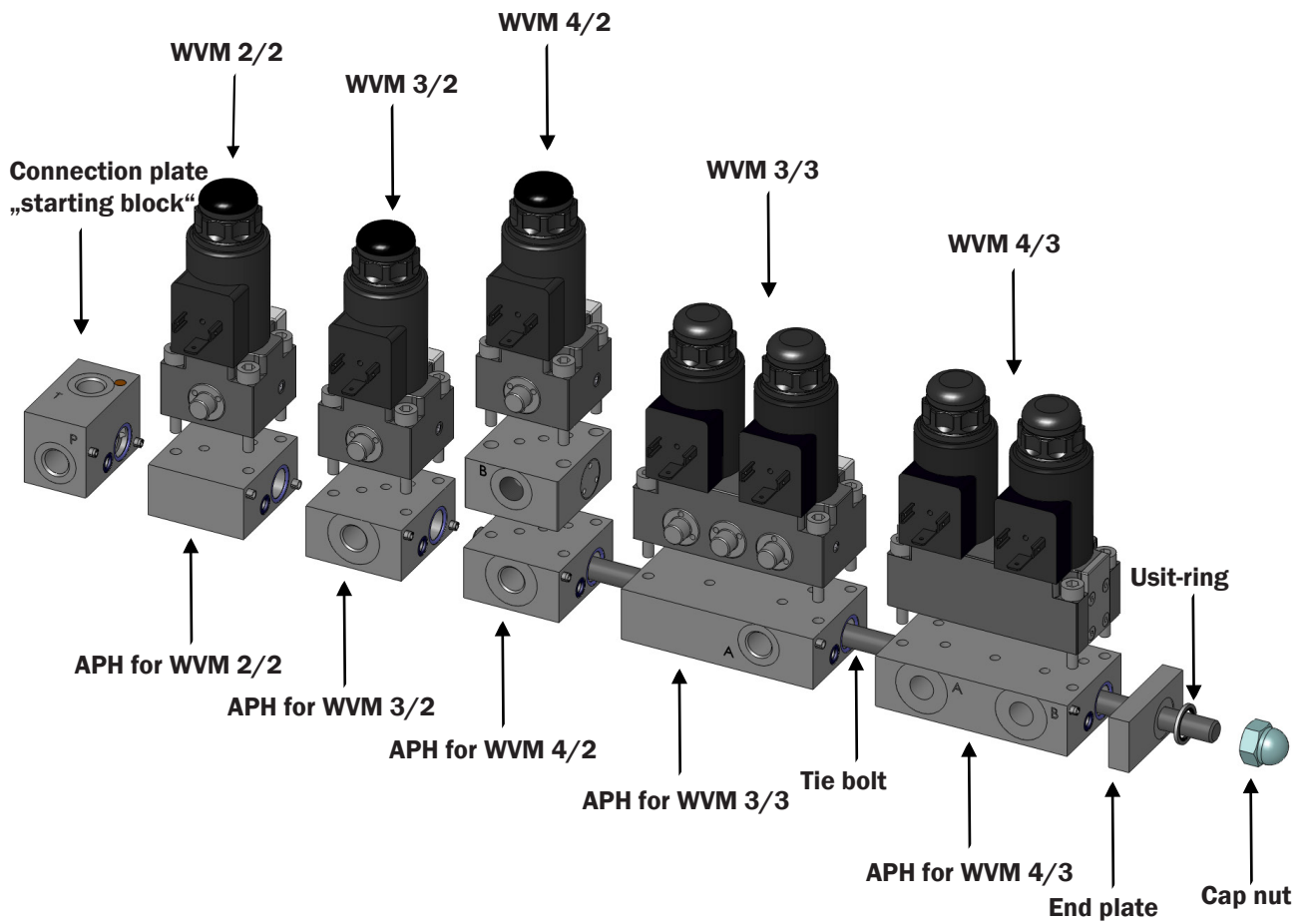
Cap nut



Usit-ring

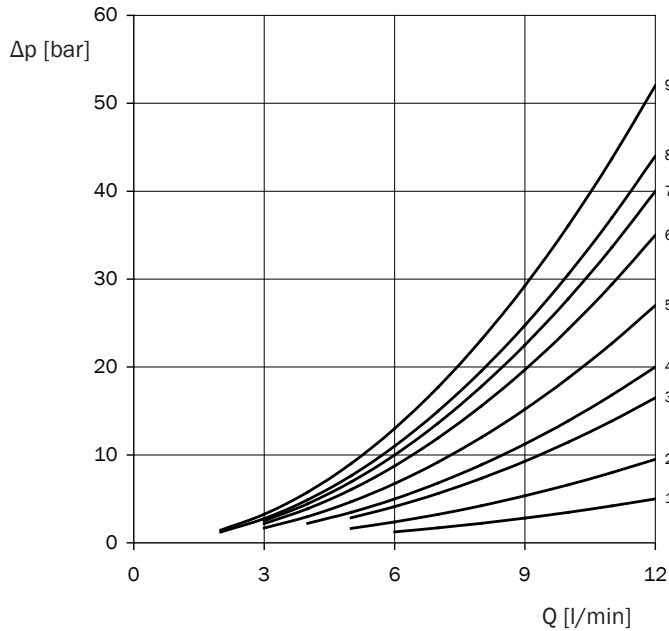


Example valve bank



Characteristics

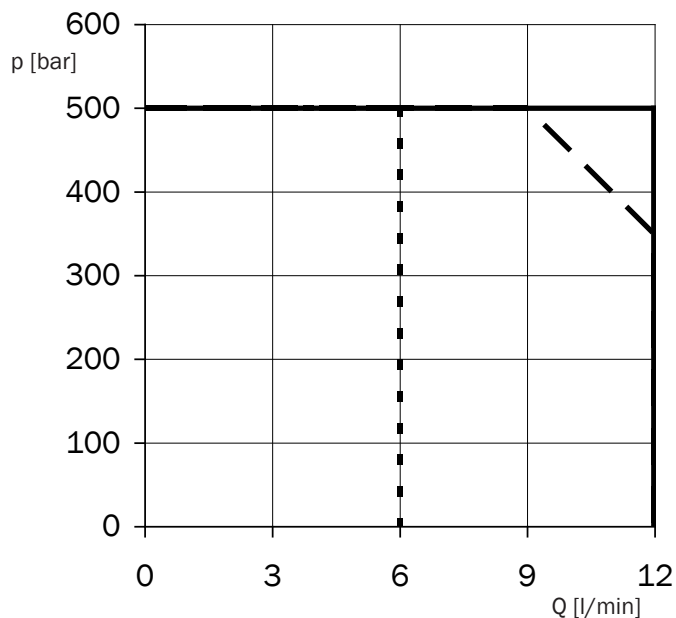
Pressure drop



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

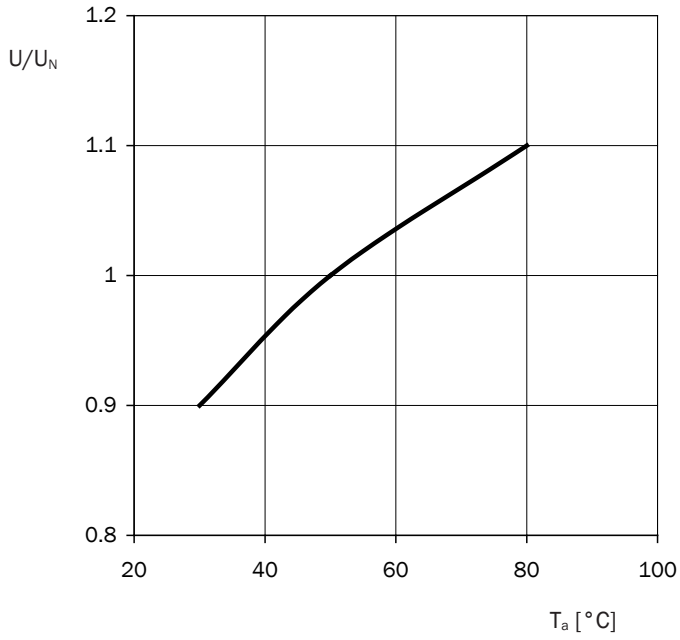
() = for neutral position

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

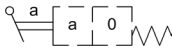
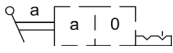
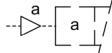

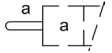
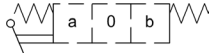
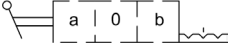
Actuators

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

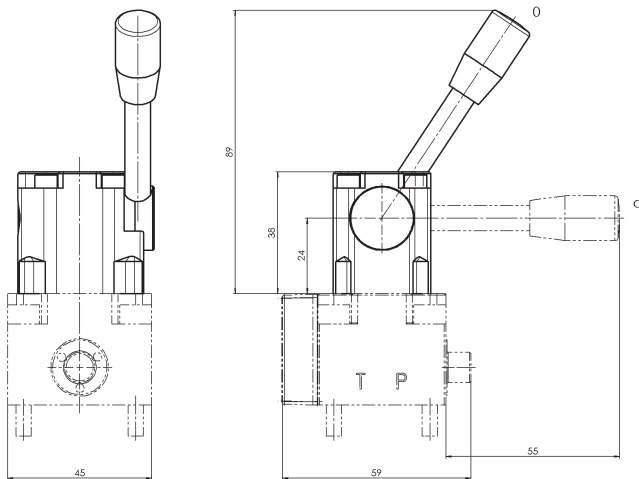
Note: Technical data for solenoids see page 1

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

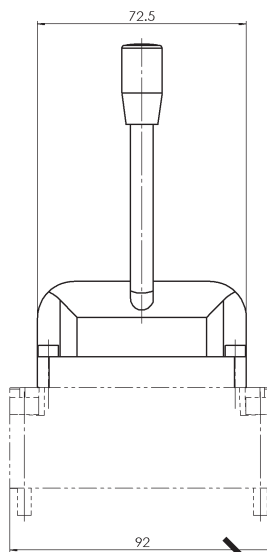
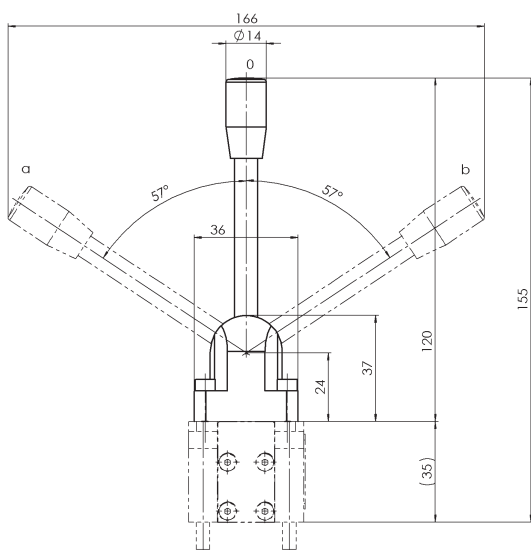
Manual lever for 2/2-, 3/2- and 4/2-valve spring return or with detent



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

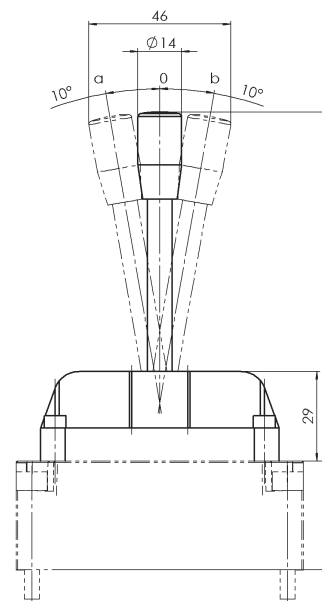
Version „lateral“

(in combination preferably with APH plates for valve banks)



Version „lengthwise“

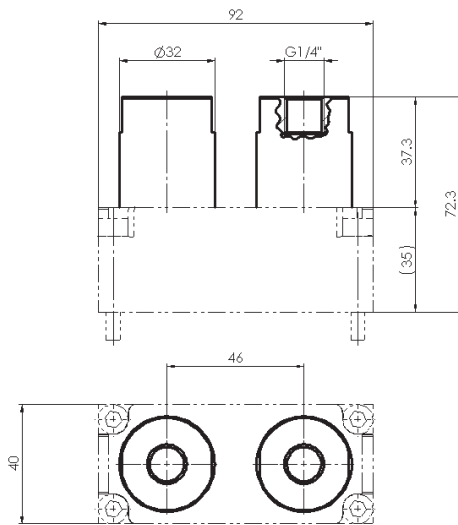
(in combination preferably with EAP plates for stand-alone valves)



Type WVM-4B

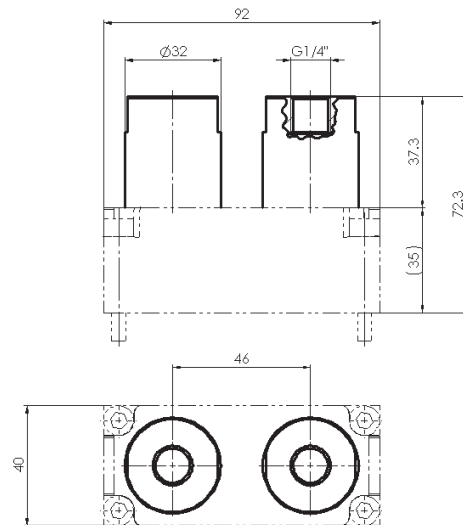
NG 4
up to 12 l/min

Pneumatic (all valve types)



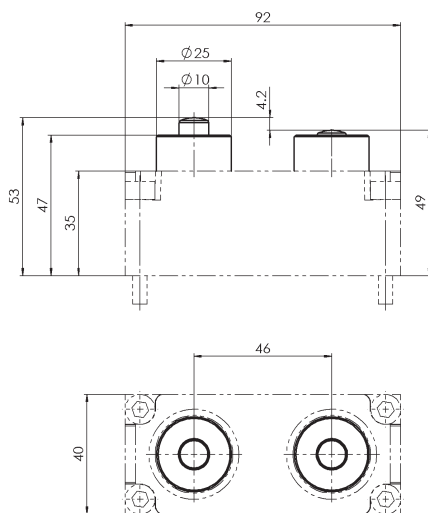
(Illustration for 3/3- or 4/3-valve)

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