

Valves



V60-63 Series

In-line valves

Solenoid and pilot actuated

Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2

High flow rate

Small volumetric size

Proven sealing system

Different manual override options as standard

Maintenance-free

Low power consumption (2 W)

Application oriented pilot controls

Manifold system for easy assembly

Multiple pressure options

Technical data

Medium:

Compressed air, filtered to 50 µm, lubricated* or non lubricated.

Operation:

Electromagnetically or pneumatically controlled

Mounting position:

Optional

Connection:

G1/8 up to G1/2

Operating pressure:

1,5/2 up to 8/10 bar

Flow direction:

Internal pilot supply: fixed

External pilot supply: optional

Flow:

Size	3/2, 5/2	2 x 3/2, 5/3
G1/8	750	500
G1/4	1300	950
G3/8	2600	1900
G1/2	4200	2200 (5/3)

Ambient temperature:

-10°C to +50°C

Fluid temperature:

-10°C to +50°C

Consult our Technical Service for use below +2°C.

Materials

Housing and base plate: aluminium

Spindle: stainless steel,

Piston, spacers and cover: synthetic material

Static and dynamic seals: NBR,

Screws: zinc plated

Springs: stainless steel.

Alternative models

NPT ports.



3/2 valves, solenoid actuated

Model	Function	Port size	Actuation	Pilot supply	Pilot exhaust	Solenoid variant	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Drawing no.
V60A413A-A#***	NC	G1/8	Sol/air	Internal	Not collected	1	750	2 ... 8	—	0,22	1
V60A423A-A#***	NC	G1/8	Sol/air	External	Not collected	1	750	-0,9 ... 8	3 ... 8	0,22	1
V60A417A-A#***	NC	G1/8	Sol/spring	Internal	Not collected	1	750	3 ... 8	—	0,22	28
V60A413D-C#13A	NC	G1/8	Sol/air	Internal	Collected	2	750	2 ... 10	—	0,21	4
V60A423D-C#13A	NC	G1/8	Sol/air	External	Collected	2	750	-0,9 ... 10	3 ... 10	0,21	4
V61B413A-A#***	NC	G1/4	Sol/air	Internal	Not collected	1	1300	2 ... 8	—	0,29	1
V61B423A-A#***	NC	G1/4	Sol/air	External	Not collected	1	1300	-0,9 ... 8	3 ... 8	0,29	1
V61B417A-A#***	NC	G1/4	Sol/spring	Internal	Not collected	1	1300	3 ... 8	—	0,29	28
V61B413D-C#13A	NC	G1/4	Sol/air	Internal	Collected	2	1300	2 ... 10	—	0,27	4
V61B423D-C#13A	NC	G1/4	Sol/air	External	Collected	2	1300	-0,9 ... 10	3 ... 10	0,27	4
V62C413A-A#***	NC	G3/8	Sol/air	Internal	Not collected	1	2600	2 ... 8	—	0,52	1
V62C423A-A#***	NC	G3/8	Sol/air	External	Not collected	1	2600	-0,9 ... 8	3 ... 8	0,52	1
V62C417A-A#***	NC	G3/8	Sol/spring	Internal	Not collected	1	2600	3 ... 8	—	0,52	28
V62C413D-C#13A	NC	G3/8	Sol/air	Internal	Collected	2	2600	2 ... 10	—	0,50	4
V62C423D-C#13A	NC	G3/8	Sol/air	External	Collected	2	2600	-0,9 ... 10	3 ... 10	0,50	4
V63D413A-A#***	NC	G1/2	Sol/air	Internal	Not collected	1	4200	2 ... 8	—	0,78	5
V63D423A-A#***	NC	G1/2	Sol/air	External	Not collected	1	4200	-0,9 ... 8	3 ... 8	0,78	5
V63D417A-A#***	NC	G1/2	Sol/spring	Internal	Not collected	1	4200	3 ... 8	—	0,78	31
V60A313A-A#***	NO	G1/8	Sol/air	Internal	Not collected	1	750	2 ... 8	—	0,22	2
V60A323A-A#***	NO	G1/8	Sol/air	External	Not collected	1	750	-0,9 ... 8	3 ... 8	0,22	1
V60A313D-C#13A	NO	G1/8	Sol/air	Internal	Collected	2	750	2 ... 10	—	0,21	4
V60A323D-C#13A	NO	G1/8	Sol/air	External	Collected	2	750	-0,9 ... 10	3 ... 10	0,21	4
V61B313A-A#***	NO	G1/4	Sol/air	Internal	Not collected	1	1300	2 ... 8	—	0,29	2
V61B323A-A#***	NO	G1/4	Sol/air	External	Not collected	1	1300	-0,9 ... 8	3 ... 8	0,29	1
V61B313D-C#13A	NO	G1/4	Sol/air	Internal	Collected	2	1300	2 ... 10	—	0,27	4
V61B323D-C#13A	NO	G1/4	Sol/air	External	Collected	2	1300	-0,9 ... 10	3 ... 10	0,27	4
V62C313A-A#***	NO	G3/8	Sol/air	Internal	Not collected	1	2600	2 ... 8	—	0,52	2
V62C323A-A#***	NO	G3/8	Sol/air	External	Not collected	1	2600	-0,9 ... 8	3 ... 8	0,52	1
V62C313D-C#13A	NO	G3/8	Sol/air	Internal	Collected	2	2600	2 ... 10	—	0,50	4
V62C323D-C#13A	NO	G3/8	Sol/air	External	Collected	2	2600	-0,9 ... 10	3 ... 10	0,50	4
V63D313A-A#***	NO	G1/2	Sol/air	Internal	Not collected	1	4200	2 ... 8	—	0,78	32
V63D323A-A#***	NO	G1/2	Sol/air	External	Not collected	1	4200	-0,9 ... 8	3 ... 8	0,78	5
V60A411A-A#***	—	G1/8	Sol/Sol	Internal	Not collected	1	750	1,5 ... 8	—	0,30	3
V60A422A-A#***	—	G1/8	Sol/Sol	External	Not collected	1	750	-0,9 ... 8	3 ... 8	0,30	3
V60A411D-C#13A	—	G1/8	Sol/Sol	Internal	Collected	2	750	1,5 ... 10	—	0,20	4
V60A422D-C#13A	—	G1/8	Sol/Sol	External	Collected	2	750	-0,9 ... 10	3 ... 10	0,20	4
V61B411A-A#***	—	G1/4	Sol/Sol	Internal	Not collected	1	1300	1,5 ... 8	—	0,38	3
V61B422A-A#***	—	G1/4	Sol/Sol	External	Not collected	1	1300	-0,9 ... 8	3 ... 8	0,38	3
V61B411D-C#13A	—	G1/4	Sol/Sol	Internal	Collected	2	1300	1,5 ... 10	—	0,27	4
V61B422D-C#13A	—	G1/4	Sol/Sol	External	Collected	2	1300	-0,9 ... 10	3 ... 10	0,27	4
V62C411A-A#***	—	G3/8	Sol/Sol	Internal	Not collected	1	2600	1,5 ... 8	—	0,61	3
V62C422A-A#***	—	G3/8	Sol/Sol	External	Not collected	1	2600	-0,9 ... 8	3 ... 8	0,61	3
V62C411D-C#13A	—	G3/8	Sol/Sol	Internal	Collected	2	2600	1,5 ... 10	—	0,50	4
V62C422D-C#13A	—	G3/8	Sol/Sol	External	Collected	2	2600	-0,9 ... 10	3 ... 10	0,50	4
V63D411A-A#***	—	G1/2	Sol/Sol	Internal	Not collected	1	4200	1,5 ... 8	—	0,87	6
V63D422A-A#***	—	G1/2	Sol/Sol	External	Not collected	1	4200	-0,9 ... 8	3 ... 8	0,87	6

*** Insert coil code from table below or 000 for version without solenoid. For manual override options, substitute '#' as follows:

1 = without manual override (on request), 2 = push and lock, 3 = push only. Note: Further mechanical spring return options on request

NC = Normally closed, NO = Normally open

V60-63 Series

In-line valves

Solenoid and pilot actuated

Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2

2 x 3/2 valves, solenoid actuated

Model	Function	Port size	Actuation	Pilot supply	Pilot exhaust	Solenoid variant	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60AA11A-A#***	NC	G1/8	Sol/Sol	Internal	Not collected	1	500	2 ... 8	—	0,34	7
V60AA11D-C#13A	NC	G1/8	Sol/Sol	Internal	Collected	2	500	2 ... 10	—	0,24	8
V61BA11A-A#***	NC	G1/4	Sol/Sol	Internal	Not collected	1	950	2 ... 8	—	0,43	7
V61BA11D-C#13A	NC	G1/4	Sol/Sol	Internal	Collected	2	950	2 ... 10	—	0,33	8
V62CA11A-A#***	NC	G3/8	Sol/Sol	Internal	Not collected	1	1900	2 ... 8	—	0,73	7
V62CA11D-C#13A	NC	G3/8	Sol/Sol	Internal	Collected	2	1900	2 ... 10	—	0,63	8
V60AB11A-A#***	NO	G1/8	Sol/Sol	Internal	Not collected	1	500	2 ... 8	—	0,34	7
V60AB11D-C#13A	NO	G1/8	Sol/Sol	Internal	Collected	2	500	2 ... 10	—	0,24	8
V61BB11A-A#***	NO	G1/4	Sol/Sol	Internal	Not collected	1	950	2 ... 8	—	0,43	7
V61BB11D-C#13A	NO	G1/4	Sol/Sol	Internal	Collected	2	950	2 ... 10	—	0,33	8
V62CB11A-A#***	NO	G3/8	Sol/Sol	Internal	Not collected	1	1900	2 ... 8	—	0,73	7
V62CB11D-C#13A	NO	G3/8	Sol/Sol	Internal	Collected	2	1900	2 ... 10	—	0,63	8
V60AC11A-A#***	NO/NC	G1/8	Sol/Sol	Internal	Not collected	1	500	2 ... 8	—	0,34	7
V60AC11D-C#13A	NO/NC	G1/8	Sol/Sol	Internal	Collected	2	500	2 ... 10	—	0,24	8
V61BC11A-A#***	NO/NC	G1/4	Sol/Sol	Internal	Not collected	1	950	2 ... 8	—	0,43	7
V61BC11D-C#13A	NO/NC	G1/4	Sol/Sol	Internal	Collected	2	950	2 ... 10	—	0,33	8
V62CC11A-A#***	NO/NC	G3/8	Sol/Sol	Internal	Not collected	1	1900	2 ... 8	—	0,73	7
V62CC11D-C#13A	NO/NC	G3/8	Sol/Sol	Internal	Collected	2	1900	2 ... 10	—	0,63	8

*** Insert coil code from table below or 000 for version without solenoid. For manual override options, substitute '#' as follows: 1 = without manual override (on request), 2 = push and lock, 3 = push only

NC/NC = Both valves normally closed (port P) NO/NO = Both valves normally open (port P) NO/NC = 1 valve normally open, 1 valve normally closed (port P)

5/2 valves, solenoid actuated

Model	Port size	Actuation	Pilot supply	Pilot exhaust	Solenoid variant	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60A513A-A#***	G1/8	Sol/air	Internal	Not collected	1	750	2 ... 8	—	0,24	9
V60A523A-A#***	G1/8	Sol/air	External	Not collected	1	750	-0,9 ... 8	3 ... 8	0,24	9
V60A517A-A#***	G1/8	Sol/Spring	Internal	Not collected	1	750	3 ... 8	—	0,24	29
V60A527A-A#***	G1/8	Sol/Spring	External	Not collected	1	750	-0,9 ... 8	3 ... 8	0,24	29
V60A513D-C#13A	G1/8	Sol/air	Internal	Collected	2	750	2 ... 10	—	0,23	11
V60A523D-C#13A	G1/8	Sol/air	External	Collected	2	750	-0,9 ... 10	3 ... 10	0,23	11
V61B513A-A#***	G1/4	Sol/air	Internal	Not collected	1	1300	2 ... 8	—	0,33	9
V61B523A-A#***	G1/4	Sol/air	External	Not collected	1	1300	-0,9 ... 8	3 ... 8	0,33	9
V61B517A-A#***	G1/4	Sol/Spring	Internal	Not collected	1	1300	3 ... 8	—	0,33	29
V61B527A-A#***	G1/4	Sol/Spring	External	Not collected	1	1300	-0,9 ... 8	3 ... 8	0,33	29
V61B513D-C#13A	G1/4	Sol/air	Internal	Collected	2	1300	2 ... 10	—	0,32	11
V61B523D-C#13A	G1/4	Sol/air	External	Collected	2	1300	-0,9 ... 10	3 ... 10	0,32	11
V62C513A-A#***	G3/8	Sol/air	Internal	Not collected	1	2600	2 ... 8	—	0,62	9
V62C523A-A#***	G3/8	Sol/air	External	Not collected	1	2600	-0,9 ... 8	3 ... 8	0,62	9
V62C517A-A#***	G3/8	Sol/Spring	Internal	Not collected	1	2600	3 ... 8	—	0,62	29
V62C527A-A#***	G3/8	Sol/Spring	External	Not collected	1	2600	-0,9 ... 8	3 ... 8	0,62	29
V62C513D-C#13A	G3/8	Sol/air	Internal	Collected	2	2600	2 ... 10	—	0,61	11
V62C523D-C#13A	G3/8	Sol/air	External	Collected	2	2600	-0,9 ... 10	3 ... 10	0,61	11
V63D513A-A#***	G1/8	Sol/air	Internal	Not collected	1	4200	2 ... 8	—	0,96	12
V63D523A-A#***	G1/8	Sol/air	External	Not collected	1	4200	-0,9 ... 8	3 ... 8	0,96	12
V63D517A-A#***	G1/2	Sol/Spring	Internal	Not collected	1	4200	3 ... 8	—	0,96	33
V63D527A-A#***	G1/2	Sol/Spring	External	Not collected	1	4200	-0,9 ... 8	—	0,96	33
V60A511A-A#***	G1/8	Sol/Sol	Internal	Not collected	1	750	2 ... 8	—	0,33	10
V60A522A-A#***	G1/8	Sol/Sol	External	Not collected	1	750	-0,9 ... 8	3 ... 8	0,33	10
V60A511D-C#13A	G1/8	Sol/Sol	Internal	Collected	2	750	2 ... 10	—	0,23	11
V60A522D-C#13A	G1/8	Sol/Sol	External	Collected	2	750	-0,9 ... 10	3 ... 10	0,23	11
V61B511A-A#***	G1/4	Sol/Sol	Internal	Not collected	1	1300	2 ... 8	—	0,42	10
V61B522A-A#***	G1/4	Sol/Sol	External	Not collected	1	1300	-0,9 ... 8	3 ... 8	0,42	10
V61B511D-C#13A	G1/4	Sol/Sol	Internal	Collected	2	1300	2 ... 10	—	0,32	11
V61B522D-C#13A	G1/4	Sol/Sol	External	Collected	2	1300	-0,9 ... 10	3 ... 10	0,32	11
V62C511A-A#***	G3/8	Sol/Sol	Internal	Not collected	1	2600	2 ... 8	—	0,72	10
V62C522A-A#***	G3/8	Sol/Sol	External	Not collected	1	2600	-0,9 ... 8	3 ... 8	0,72	10
V62C511D-C#13A	G3/8	Sol/Sol	Internal	Collected	2	2600	2 ... 10	—	0,62	11
V62C522D-C#13A	G3/8	Sol/Sol	External	Collected	2	2600	-0,9 ... 10	3 ... 10	0,62	11
V63D511A-A#***	G1/8	Sol/Sol	Internal	Not collected	1	4200	2 ... 8	—	0,98	13
V63D522A-A#***	G1/8	Sol/Sol	External	Not collected	1	4200	-0,9 ... 8	3 ... 8	0,98	13

*** Insert coil code from table below or 000 for version without solenoid. For manual override options, substitute '#' as follows:

1 = without manual override (on request), 2 = push and lock, 3 = push only. Note: Further mechanical spring return options on request

V60-63 Series

In-line valves

Solenoid and pilot actuated

Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2

5/3 valves, solenoid actuated

Model	Function	Port size	Actuation	Pilot supply	Pilot exhaust	Solenoid variant	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60A611A-AX***	APB	G1/8	Sol/Sol	Internal	Not collected	1	500	3 ... 8	—	0,35	14
V60A622A-AX***	APB	G1/8	Sol/Sol	External	Not collected	1	500	-0,9 ... 8	3 ... 8	0,35	14
V60A611D-CX13A	APB	G1/8	Sol/Sol	Internal	Collected	2	500	3 ... 10	—	0,25	15
V60A622D-CX13A	APB	G1/8	Sol/Sol	External	Collected	2	500	-0,9 ... 10	3 ... 10	0,25	15
V61B611A-AX***	APB	G1/4	Sol/Sol	Internal	Not collected	1	950	3 ... 8	—	0,47	14
V61B622A-AX***	APB	G1/4	Sol/Sol	External	Not collected	1	950	-0,9 ... 8	3 ... 8	0,47	14
V61B611D-CX13A	APB	G1/4	Sol/Sol	Internal	Collected	2	950	3 ... 10	—	0,37	15
V61B622D-CX13A	APB	G1/4	Sol/Sol	External	Collected	2	950	-0,9 ... 10	3 ... 10	0,37	15
V62C611A-AX***	APB	G3/8	Sol/Sol	Internal	Not collected	1	1900	3 ... 8	—	0,81	14
V62C622A-AX***	APB	G3/8	Sol/Sol	External	Not collected	1	1900	-0,9 ... 8	3 ... 8	0,81	14
V62C611D-CX13A	APB	G3/8	Sol/Sol	Internal	Collected	2	1900	3 ... 10	3 ... 10	0,71	15
V62C622D-CX13A	APB	G3/8	Sol/Sol	External	Collected	2	1900	-0,9 ... 10	3 ... 10	0,71	15
V63D611A-A#***	APB	G1/2	Sol/Sol	Internal	Not collected	1	2200	2,5 ... 8	—	1,2	30
V60A711A-AX***	COE	G1/8	Sol/Sol	Internal	Not collected	1	500	3 ... 8	—	0,35	14
V60A722A-AX***	COE	G1/8	Sol/Sol	External	Not collected	1	500	-0,9 ... 8	3 ... 8	0,35	14
V60A711D-CX13A	COE	G1/8	Sol/Sol	Internal	Collected	2	500	3 ... 10	—	0,25	15
V60A722D-CX13A	COE	G1/8	Sol/Sol	External	Collected	2	500	-0,9 ... 10	3 ... 10	0,25	15
V61B711A-AX***	COE	G1/4	Sol/Sol	Internal	Not collected	1	950	3 ... 8	—	0,47	14
V61B722A-AX***	COE	G1/4	Sol/Sol	External	Not collected	1	950	-0,9 ... 8	3 ... 8	0,47	14
V61B711D-CX13A	COE	G1/4	Sol/Sol	Internal	Collected	2	950	3 ... 10	—	0,37	15
V61B722D-CX13A	COE	G1/4	Sol/Sol	External	Collected	2	950	-0,9 ... 10	3 ... 10	0,37	15
V62C711A-AX***	COE	G3/8	Sol/Sol	Internal	Not collected	1	1900	3 ... 8	—	0,81	14
V62C722A-AX***	COE	G3/8	Sol/Sol	External	Not collected	1	1900	-0,9 ... 8	3 ... 8	0,81	14
V62C711D-CX13A	COE	G3/8	Sol/Sol	Internal	Collected	2	1900	3 ... 10	—	0,71	15
V62C722D-CX13A	COE	G3/8	Sol/Sol	External	Collected	2	1900	-0,9 ... 10	3 ... 10	0,71	15
V63D711A-A#***	COE	G1/2	Sol/Sol	Internal	Not collected	1	2200	2,5 ... 8	—	1,2	30
V60A811A-AX***	COP	G1/8	Sol/Sol	Internal	Not collected	1	500	3 ... 8	—	0,35	14
V60A822A-AX***	COP	G1/8	Sol/Sol	External	Not collected	1	500	-0,9 ... 8	3 ... 8	0,35	14
V60A811D-CX13A	COP	G1/8	Sol/Sol	Internal	Collected	2	500	3 ... 10	—	0,25	15
V60A822D-CX13A	COP	G1/8	Sol/Sol	External	Collected	2	500	-0,9 ... 10	3 ... 10	0,25	15
V61B811A-AX***	COP	G1/4	Sol/Sol	Internal	Not collected	1	950	3 ... 8	—	0,47	14
V61B822A-AX***	COP	G1/4	Sol/Sol	External	Not collected	1	950	-0,9 ... 8	3 ... 8	0,47	14
V61B811D-CX13A	COP	G1/4	Sol/Sol	Internal	Collected	2	950	3 ... 10	—	0,37	15
V61B822D-CX13A	COP	G1/4	Sol/Sol	External	Collected	2	950	-0,9 ... 10	3 ... 10	0,37	15
V62C811A-AX***	COP	G3/8	Sol/Sol	Internal	Not collected	1	1900	3 ... 8	—	0,81	14
V62C822A-AX***	COP	G3/8	Sol/Sol	External	Not collected	1	1900	-0,9 ... 8	3 ... 8	0,81	14
V62C811D-CX13A	COP	G3/8	Sol/Sol	Internal	Collected	2	1900	3 ... 10	—	0,71	15
V62C822D-CX13A	COP	G3/8	Sol/Sol	External	Collected	2	1900	-0,9 ... 10	3 ... 10	0,71	15

*** Insert coil code from table below or 000 for version without solenoid. For manual override options, substitute '#' as follows: 1 = without manual override (on request), 2 = push and lock, 3 = push only.

APB = All Ports Blocked, COE = Centre Open Exhaust, COP = Centre Open Pressure.

Coil & voltage codes

Solenoid variant 1 (solenoid rotates 4 x 90°)

22 mm coil DIN EN 175 301-803 (DIN 43650 B)

Voltage	Coil code	Power inrush/hold	Model
12 V d.c.	12L	2 W	V10626-A12L
24 V d.c.	13L	2 W	V10626-A13L
24 V 50/60 Hz	14L	4/2,5 VA	V10626-A14L
48 V 50/60 Hz	16L	4/2,5 VA	V10626-A16L
110/120 V 50/60 Hz	18L	4/2,5 VA	V10626-A18L
220/240 V 50/60 Hz	19L	6/5 VA	V10626-A19L

Solenoid variant 2

Double solenoid DIN EN 175 301-803 (DIN 43650 type C) 4 pin

Voltage	Coil code	Power inrush/hold	Manual override*	Model
24 V d.c.	13 A	2 W	Push only	9031703900002400
24 V d.c.	13 A	2 W	Turn & lock	9031704900002400
24 V d.c.	13 A	2 W	Without	9031705900002400

Connector plugs must be ordered separately – see page 383

* On request

22 mm coil industrial standard

Voltage	Coil code	Power inrush/hold	Model
12 V d.c.	12J	2 W	QM/48/12J/21
24 V d.c.	13J	2 W	QM/48/13J/21
24 V 50/60 Hz	14J	4/2,5 VA	QM/48/14J/21
48 V 50/60 Hz	16J	4/2,5 VA	QM/48/16J/21
110/120 V 50/60 Hz	18J	4/2,5 VA	QM/48/18J/21
220/240 V 50/60 Hz	19J	6/5 VA	QM/48/19J/21

Electrical details

Voltage tolerance:	±10%
Rating:	100% E.D.
Protection class:	IP 65 with sealed plugs (ISO 6952)

Plug configuration, valve side/twin pilot

Symbol	Plug no.	Function	Actuation
	1	(+)	12 (Solenoid 2)
	2	(-)	12 + 14
	3	(+)	14 (Solenoid 1)

V60-63 Series

In-line valves

Solenoid and pilot actuated
Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2

3/2 valves, pilot actuated

Model	Function	Port size	Operator 12	Operator 10	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60A4D7A-XA090	NC	G1/8	Air	Spring	750	-0,9 ... 10	2,5 ... 10	0,13	16
V61B4D7A-XA090	NC	G1/4	Air	Spring	1300	-0,9 ... 10	2,5 ... 10	0,21	16
V62C4D7A-XA090	NC	G3/8	Air	Spring	2600	-0,9 ... 10	2,5 ... 10	0,43	16
V63D4D7A-XA090	NC	G1/2	Air	Spring	4200	-0,9 ... 16	3 ... 16	0,75	20
V60A3D7A-XA090	NO	G1/8	Spring	Air	750	-0,9 ... 10	2,5 ... 10	0,13	17
V61B3D7A-XA090	NO	G1/4	Spring	Air	1300	-0,9 ... 10	2,5 ... 10	0,21	17
V62C3D7A-XA090	NO	G3/8	Spring	Air	2600	-0,9 ... 10	2,5 ... 10	0,43	17
V63D3D7A-XA090	NO	G1/2	Spring	Air	4200	-0,9 ... 16	3 ... 16	0,75	34
V60A4DDA-XA020	—	G1/8	Air	Air	750	-0,9 ... 10	1,5 ... 10	0,13	18
V61B4DDA-XA020	—	G1/4	Air	Air	1300	-0,9 ... 10	1,5 ... 10	0,21	18
V62C4DDA-XA020	—	G3/8	Air	Air	2600	-0,9 ... 10	1,5 ... 10	0,43	18
V63D4DDA-XA020	—	G1/2	Air	Air	4200	-0,9 ... 16	1,5 ... 16	0,68	21

NC = Normally closed, NO = Normally open

2 x 3/2 valves, pilot actuated

Model	Function	Port size	Operator 14	Operator 12	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60AADDA-XA020	NC	G1/8	Air	Air	500	2 ... 10	2 ... 10	0,18	19
V61BADDA-XA020	NC	G1/4	Air	Air	950	2 ... 10	2 ... 10	0,28	19
V62CADDA-XA020	NC	G3/8	Air	Air	1900	2 ... 10	2 ... 10	0,60	19
Model	Function	Port size	Operator 10	Operator 10	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60ABDDA-XA020	NO	G1/8	Air	Air	500	2 ... 10	2 ... 10	0,18	19
V61BBDDA-XA020	NO	G1/4	Air	Air	950	2 ... 10	2 ... 10	0,28	19
V62CBDDA-XA020	NO	G3/8	Air	Air	1900	2 ... 10	2 ... 10	0,60	19
Model	Function	Port size	Operator 10	Operator 12	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60ACDDA-XA020	NO/NC	G1/8	Air	Air	500	2 ... 10	2 ... 10	0,18	19
V61BCDDA-XA020	NO/NC	G1/4	Air	Air	950	2 ... 10	2 ... 10	0,28	19
V62CCDDA-XA020	NO/NC	G3/8	Air	Air	1900	2 ... 10	2 ... 10	0,60	19

Note: Internal switching in middle position via spring.

NC/NC = Both valves normally closed (port P)

NO/NO = Both valves normally open (port P)

NO/NC = 1 valve normally open, 1 valve normally closed (port P)

5/2 valves, pilot actuated

Model	Port size	Operator 12	Operator 10	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60A5D7A-XA090	G1/8	Air	Spring	750	-0,9 ... 10	2,5 ... 10	0,16	22
V61B5D7A-XA090	G1/4	Air	Spring	1300	-0,9 ... 10	2,5 ... 10	0,26	22
V62C5D7A-XA090	G3/8	Air	Spring	2600	-0,9 ... 10	2,5 ... 10	0,56	22
V63D5D7A-XA090	G1/2	Air	Spring	4200	-0,9 ... 16	3 ... 16	0,92	25
V60A5DDA-XA020	G1/8	Air	Air	750	-0,9 ... 10	1,5 ... 10	0,17	23
V61B5DDA-XA020	G1/4	Air	Air	1300	-0,9 ... 10	1,5 ... 10	0,27	23
V62C5DDA-XA020	G3/8	Air	Air	2600	-0,9 ... 10	1,5 ... 10	0,58	23
V63D5DDA-XA020	G1/2	Air	Air	4200	-0,9 ... 16	1,5 ... 16	0,87	26

5/3 valves, pilot actuated

Model	Function	Port size	Operator 14	Operator 12	Flow (l/min)	Operating pressure (bar)	Pilot pressure (bar)	kg	Dimensional drawing no.
V60A6DDA-XA020	APB	G1/8	Air	Air	500	-0,9 ... 10	3 ... 10	0,2	24
V61B6DDA-XA020	APB	G1/4	Air	Air	950	-0,9 ... 10	3 ... 10	0,32	24
V62C6DDA-XA020	APB	G3/8	Air	Air	1900	-0,9 ... 10	3 ... 10	0,67	24
V63D6DDA-XA020	APB	G1/2	Air	Air	2200	-0,9 ... 10	3 ... 10	1,16	35
V60A7DDA-XA020	COE	G1/8	Air	Air	500	-0,9 ... 10	3 ... 10	0,2	24
V61B7DDA-XA020	COE	G1/4	Air	Air	950	-0,9 ... 10	3 ... 10	0,32	24
V62C7DDA-XA020	COE	G3/8	Air	Air	1900	-0,9 ... 10	3 ... 10	0,67	24
V63D7DDA-XA020	COE	G1/2	Air	Air	4200	-0,9 ... 10	3 ... 10	1,16	35
V60A8DDA-XA020	COP	G1/8	Air	Air	500	-0,9 ... 10	3 ... 10	0,2	24
V61B8DDA-XA020	COP	G1/4	Air	Air	9500	-0,9 ... 10	3 ... 10	0,32	24
V62C8DDA-XA020	COP	G3/8	Air	Air	1900	-0,9 ... 10	3 ... 10	0,67	24

Note: Internal switching in middle position via spring.

APB = All Ports Blocked, COE = Centre Open Exhaust, COP = Centre Open Pressure.

V60-63 Series

In-line valves

Solenoid and pilot actuated

Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2

Accessories

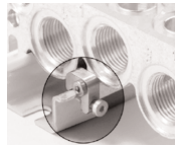
Valves

Silencer sintered bronze			Exhaust flow regulator without silencer			Exhaust flow regulator with silencer			Diffusor for pilot exhaust		Circlip for coil fixing	
												
0014400	M5	0,025 kg	4048004	G1/8	0,025 kg	4048005	G1/8	0,025 kg	81110800	0,002 kg	81021600	0,001 kg
0014510	G1/8	0,008 kg	4048104	G1/4	0,060 kg	4048105	G1/4	0,060 kg				
0014610	G1/4	0,010 kg	(G3/8 on request)			(G3/8 on request)						
0014710	G3/8	0,025 kg										
0014810	G1/2	0,060 kg										

Connectors

Industrial standard 22 mm 2-pole + PE			DIN EN 175301-803 (DIN 43650 B) 2-pole + PE			DIN EN 175301-803 (DIN 43650 C) 3-pole + PE			DIN EN 175301-803 (DIN 43650 B) with AS-i Interface		DIN EN 175301-803 (DIN 43650 B) with AS-i Interface	
												
0657868		0,005 kg	0680003		0,005 kg	0588666		0,002 kg	0101033	0,030 kg	0101032	0,030 kg
12...250 V a.c./d.c.			12...250 V a.c./d.c.			12...250 V a.c./d.c.			1 output		1 output + 2 inputs with M12 x 1	
0680000		0,005 kg	0664811		0,005 kg	0102144		0,200 kg				
15...30 V d.c.; LED, surge suppression			15...30 V d.c.; LED, surge suppression			12...250 V a.c./d.c.; cable 3 m						
0680001		0,005 kg	0664812		0,005 kg							
150...250 V a.c.; glim lamp			150...250 V a.c.; glim lamp									

Manifolds

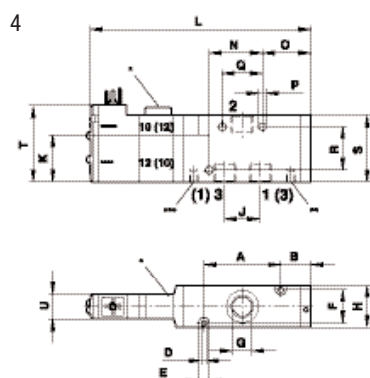
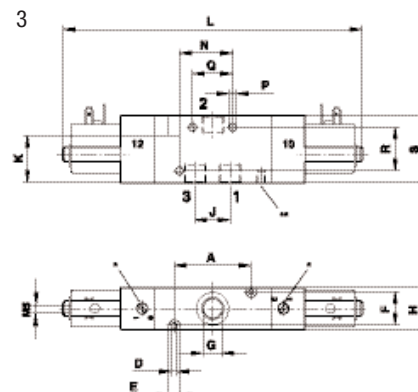
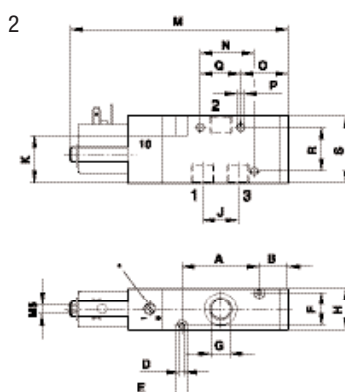
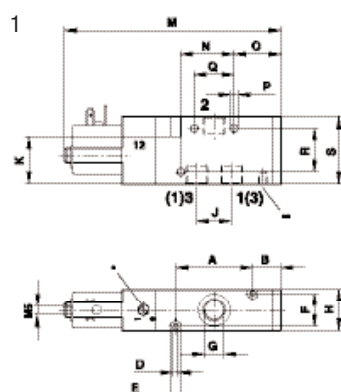
Blanking plate			Blanking plug for 2 station and 3 station manifolds			Pressure shut-off part for 4 station up to 20 station manifolds suitable for port 1			Intermediate supply/exhaust plate (instead of a valve)		Adapter plate to connect different manifold sizes	
												
0100561	(V60)	0,050 kg	0701208	(V60)	0,006 kg	0100567	(V60)	0,010 kg	0101808	(V60)	0,110 kg	0101289 (V60→V61)
0100563	(V61)	0,060 kg	0701209	(V61)	0,012 kg	0100569	(V61)	0,015 kg	0101797	(V61)	0,220 kg	0102160 (V61→V62)
0100565	(V62)	0,100 kg	0701210	(V62)	0,020 kg	0100571	(V62)	0,020 kg	0101809	(V62)	0,390 kg	0102162 (V60→V62)
Pressure switch adapter plate			DIN Rail fixing kit			Blanking plug for port 12/14 and 82/84			Blanking plug for port 1, 3, 5			
												
0102146	(V60)	0,130 kg	0101796	(V60→V62)	0,010 kg	160050018	(V60→V62)	0,008 kg	160050028	(V60)	0,015 kg	
0102148	(V61)	0,160 kg							160050038	(V61)	0,020 kg	
0102150	(V62)	0,260 kg							160050048	(V62)	0,035 kg	

V60-63 Series

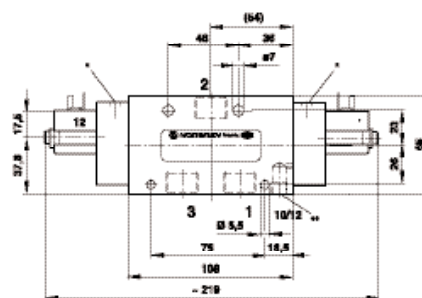
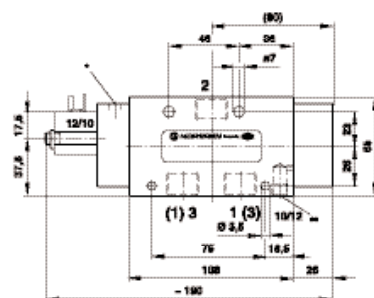
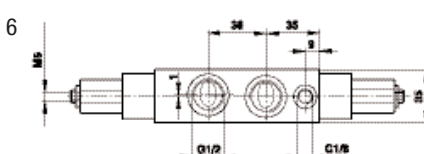
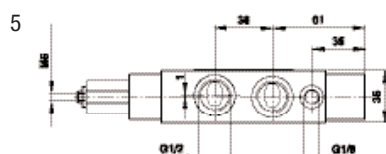
In-line valves

Solenoid and pilot actuated

Rest position and impulse versions

 $3/2, 5/2, 5/3$ and $2 \times 3/2$ 

- * Manual override
- *** Collected pilot exhaust (M5)
- **** Solenoid 1
- ***** Solenoid 2



Drawing no.	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
1	V60	35	17	–	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	–	114	25	25	4,5	18	26	35	–	–
1	V61	46	20	–	3,2	6,5	20	G1/4; 10 deep	25	21	28	–	132,5	32	31	4,5	24	26	40	–	–
1	V62	54	21	–	4,5	8	28	G3/8; 11,5 deep	34	24,4	44	–	145	12	36	4,5	26	36	55	–	–
2	V60	35	17	–	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	–	114	25	25	4,5	18	26	35	–	–
2	V61	46	20	–	3,2	6,5	20	G1/4; 10 deep	25	21	28	–	132,5	32	31	4,5	24	26	40	–	–
2	V62	54	21	–	4,5	8	28	G3/8; 11,5 deep	34	24,4	44	–	145	12	34	4,5	26	36	55	–	–
3	V60	35	–	–	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	160	–	25	–	4,5	18	26	35	–	–
3	V61	46	–	–	3,2	6,5	20	G1/4; 10 deep	25	21	28	179	–	32	–	4,5	24	26	40	–	–
3	V62	54	–	–	4,5	8	28	G3/8; 11,5 deep	34	24,4	44	194	–	12	–	4,5	26	36	55	–	–
4	V60	35	17	–	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	119	–	25	25	4,5	18	26	35	46	15
4	V61	46	18	–	3,2	6,5	20	G1/4; 10 deep	25	21	28	133	–	32	29	4,5	24	26	40	46	15
4	V62	54	21	–	4,5	8	28	G3/8; 11,5 deep	34	24,4	44	147	–	12	36	4,5	26	36	55	54	15

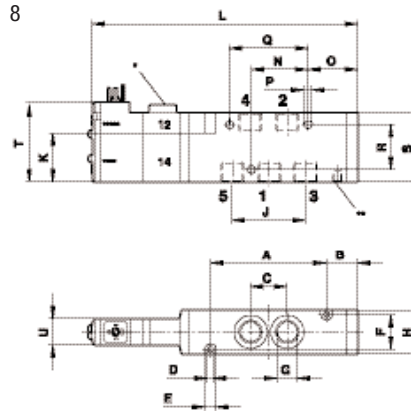
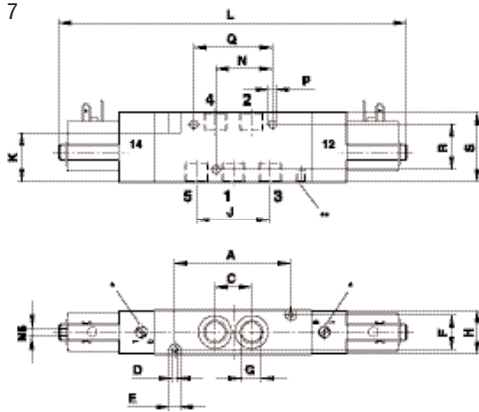
V60-63 Series

In-line valves

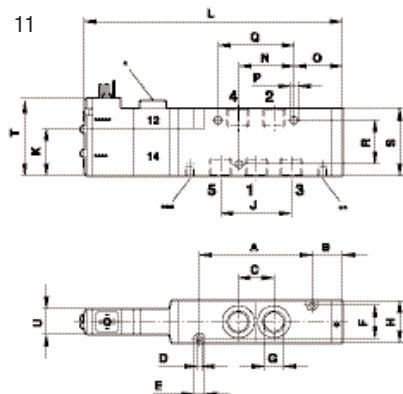
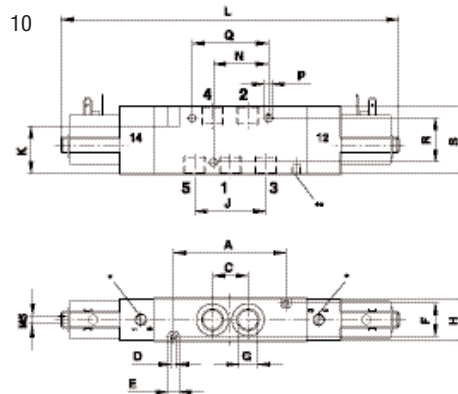
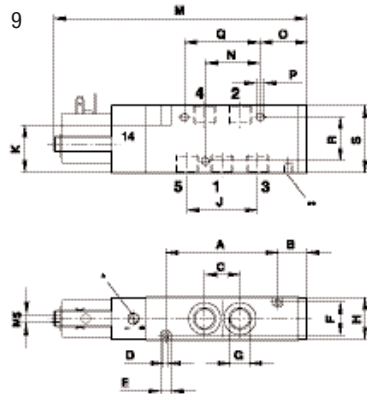
Solenoid and pilot actuated

Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2



Drawing no.	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
7	V60	50	—	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	175	—	25	—	4,5	33,6	26	35	—	—
7	V61	66	—	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	199	—	32	—	4,5	44	26	40	—	—
7	V62	78	—	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	218	—	12	—	4,5	26	36	55	—	—
8	V60	50	17	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	134	—	25	25	4,5	33,6	26	35	46	15
8	V61	66	18	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	153	—	32	29	4,5	44	26	40	46	15
8	V62	78	22	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	172	—	12	61	4,5	26	36	55	54	15



* Manual override
 ** External pilot supply (M5)
 *** Collected pilot exhaust (M5)
 **** Solenoid 1
 ***** Solenoid 2

Drawing no.	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
9	V60	50	17	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	—	129	25	25	4,5	33,6	26	35	—	—
9	V61	66	20	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	—	152,5	32	31	4,5	44	26	40	—	—
9	V62	78	21	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	—	170	12	60	4,5	26	36	55	—	—
10	V60	50	—	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	175	—	25	—	4,5	33,6	26	35	—	—
10	V61	66	—	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	199	—	32	—	4,5	44	26	40	—	—
10	V62	78	—	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	218	—	12	—	4,5	26	36	55	—	—
11	V60	50	17	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	134	—	25	25	4,5	33,6	26	35	46	15
11	V61	66	18	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	153	—	32	29	4,5	44	26	40	46	15
11	V62	78	22	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	172	—	12	61	4,5	26	36	55	54	15

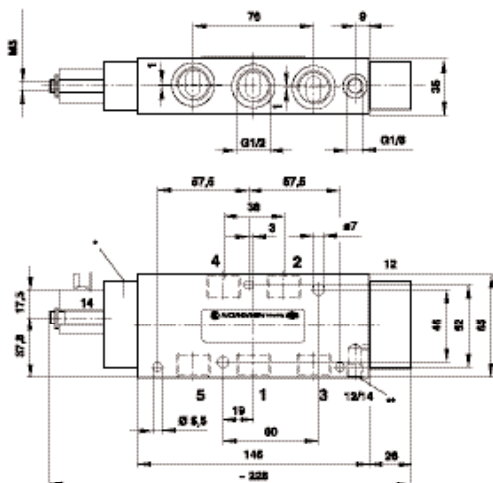
V60-63 Series

In-line valves

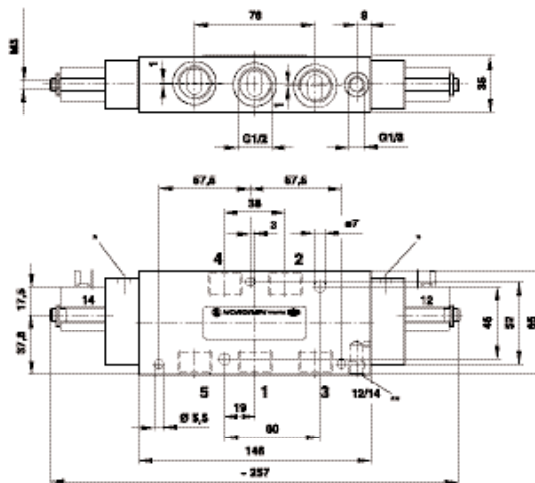
Solenoid and pilot actuated
Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2

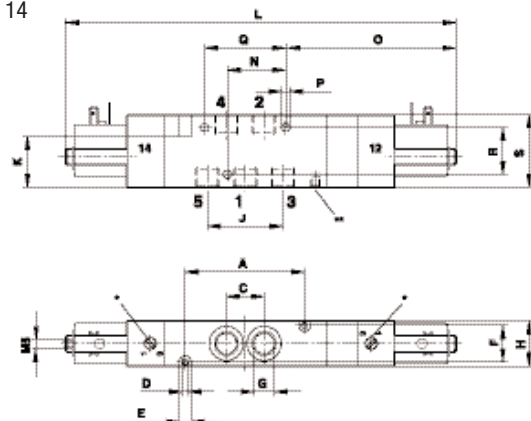
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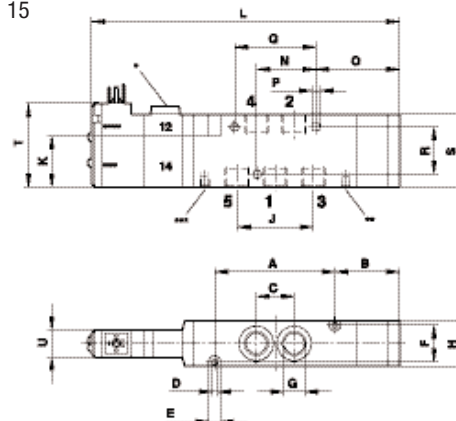
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14



15



* Manual override
** External pilot supply (M5)
*** Collected pilot exhaust (M5)
**** Solenoid 1
***** Solenoid 2

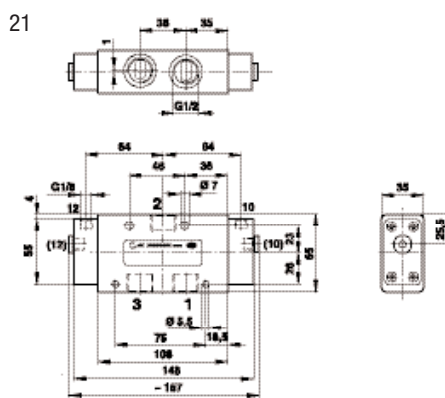
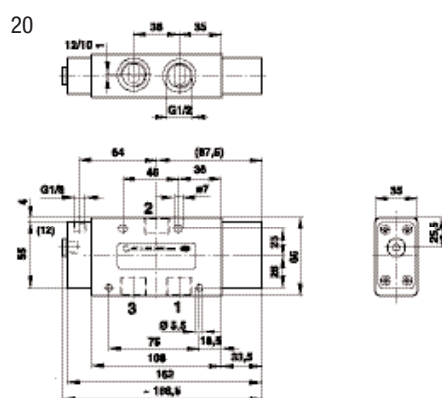
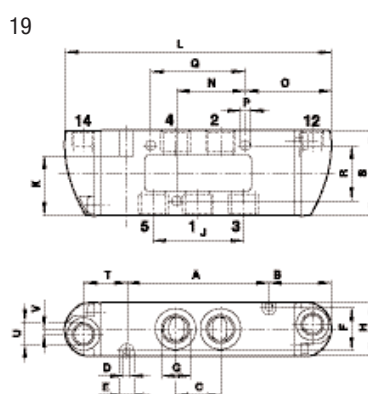
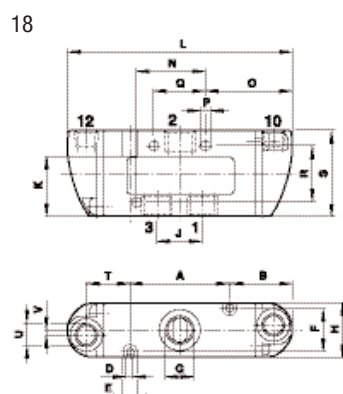
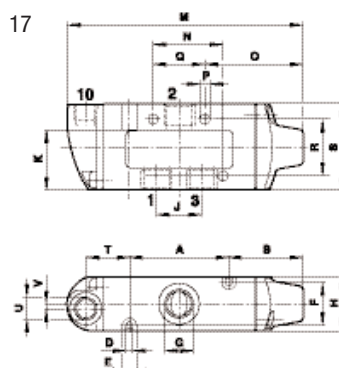
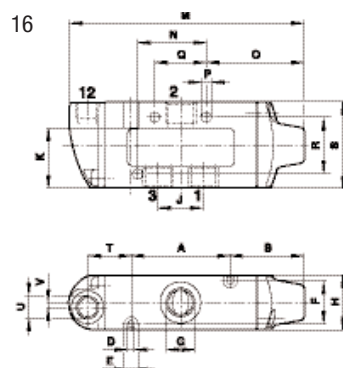
Drawing no.	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
14	V60	50	—	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	189	—	25	84,5	4,5	33,6	26	35	—	—
14	V61	66	—	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	217	—	32	—	4,5	44	26	40	—	—
14	V62	78	—	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	241	—	12	132	4,5	26	36	55	—	—
15	V60	50	31	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	148	—	25	39	4,5	33,6	26	35	46	15
15	V61	66	36	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	171	—	32	47	4,5	44	26	40	46	15
15	V62	78	44,5	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	195	—	12	84	4,5	26	36	55	54	15

V60-63 Series

In-line valves

Solenoid and pilot actuated

Rest position and impulse versions

 $3/2, 5/2, 5/3$ and $2 \times 3/2$ 

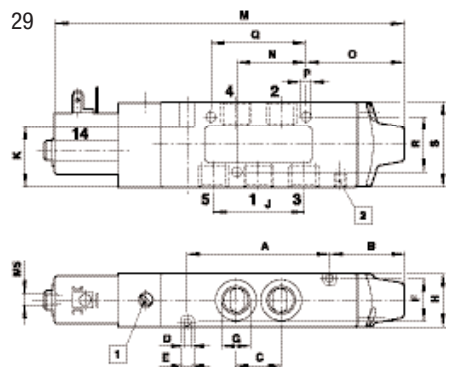
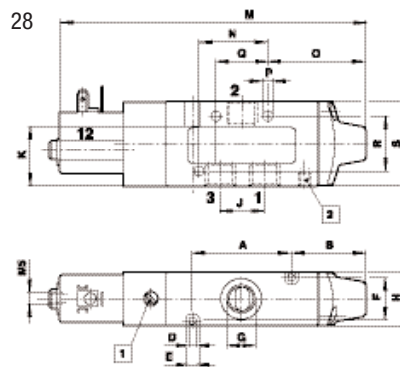
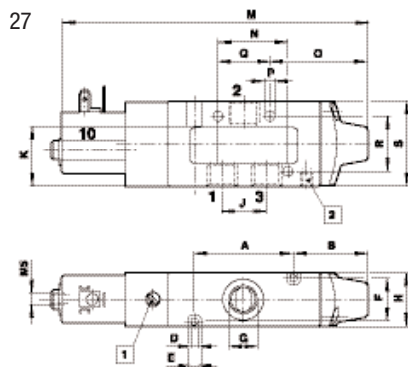
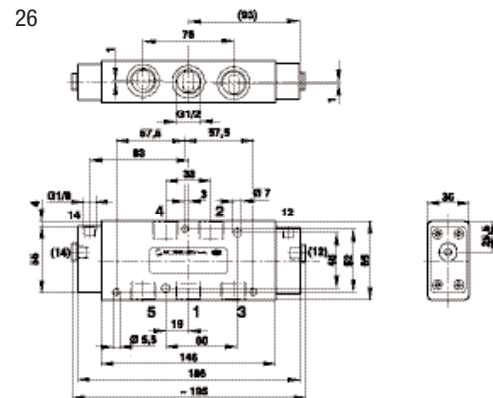
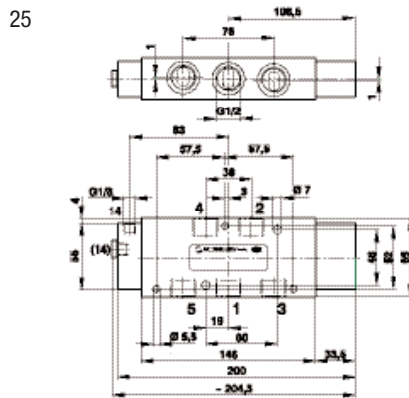
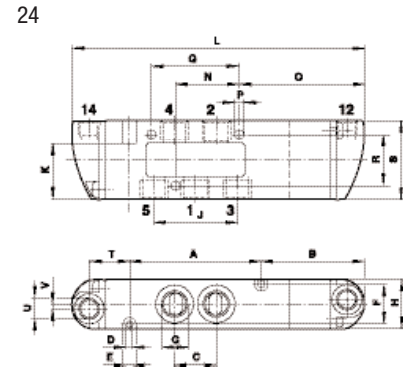
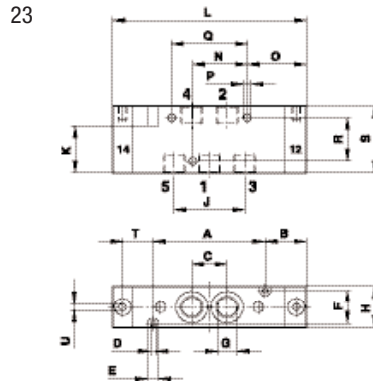
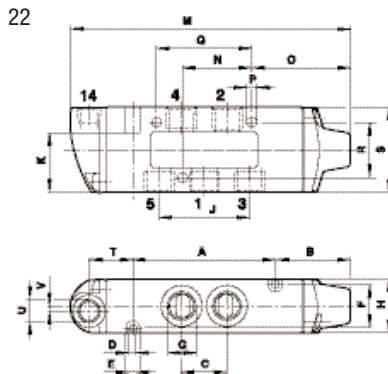
Drawing no.	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
16	V60	35	27,4	–	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	–	90	25	35,9	4,5	18	26	35	18,6	G1/8
16	V61	46	34,5	–	3,2	6,5	20	G1/4; 10 deep	25	21	28	–	110	32	45,5	4,5	24	26	40	20,2	G1/8
16	V62	54	43	–	4,5	8	28	G3/8; 11,5 deep	34	24,4	44	–	124	12	58	4,5	26	36	55	21	M 5
17	V60	35	27,4	–	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	–	90	25	35,9	4,5	18	26	35	18,6	G1/8
17	V61	46	34,5	–	3,2	6,5	20	G1/4; 10 deep	25	21	28	–	110	32	45,5	4,5	24	26	40	20,2	G1/8
17	V62	54	43	–	4,5	8	28	G3/8; 11,5 deep	34	24,4	44	–	124	12	56	4,5	26	36	55	21	M 5
18	V60	35	27,4	–	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	89	–	25	35,6	4,5	18	26	35	18,6	G1/8
18	V61	46	29	–	3,2	6,5	20	G1/4; 10 deep	25	21	28	104	–	32	40	4,5	24	26	40	20,2	G1/8
18	V62	54	27	–	4,5	8	28	G3/8; 11,5 deep	34	24,4	44	108	–	12	42	4,5	26	36	55	21	M 5
19	V60	50	27,3	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	104,5	–	25	35,5	4,5	33,6	26	35	18,7	G1/8
19	V61	66	29	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	124	–	32	40	4,5	44	26	40	20,2	G1/8
19	V62	78	27	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	132	–	12	66	4,5	26	36	55	21	M 5

V60-63 Series

In-line valves

Solenoid and pilot actuated
Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2



Drawing no.	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
22	V60	50	27,5	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	—	105	25	35,7	4,5	44	26	35	18,7	G1/8
22	V61	66	34,5	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	—	130	32	45,5	4,5	26	26	40	20,2	G1/8
22	V62	78	43	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	—	148	12	82	4,5	33,6	36	55	21	M 5
23	V60	50	27,3	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	104,5	—	25	35,5	4,5	44	26	35	18,7	G1/8
23	V61	66	29	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	124	—	32	40	4,5	26	26	40	20,2	G1/8
23	V62	78	27	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	132	—	12	66	4,5	33,6	36	55	21	M 5
24	V60	50	41,3	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	118,5	—	25	49,5	4,5	44	26	35	18,7	G1/8
24	V61	66	52	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	147	—	32	63	4,5	26	26	40	20,2	G1/8
24	V62	78	49,5	24,4	4,5	8	28	G3/8; 11,5 deep	34	48,8	44	154,5	—	12	88,5	4,5	33,6	36	55	21	M 5
28	V60	35	27,4	—	3,2	6,5	17	G1/8; 8 deep	22	16,2	28	—	125	25	35,9	4,5	18	26	35	—	—
28	V61	46	34,5	—	3,2	6,5	20	G1/4; 10 deep	25	21	28	—	147	32	45,5	4,5	24	26	40	—	—
29	V60	50	17	16,2	3,2	6,5	17	G1/8; 8 deep	22	32,4	28	—	140	25	35,7	4,5	33,6	26	35	—	—
29	V61	66	34,5	21	3,2	6,5	20	G1/4; 10 deep	25	42	28	—	167	32	45,5	4,5	44	26	40	—	—

V60-63 Series

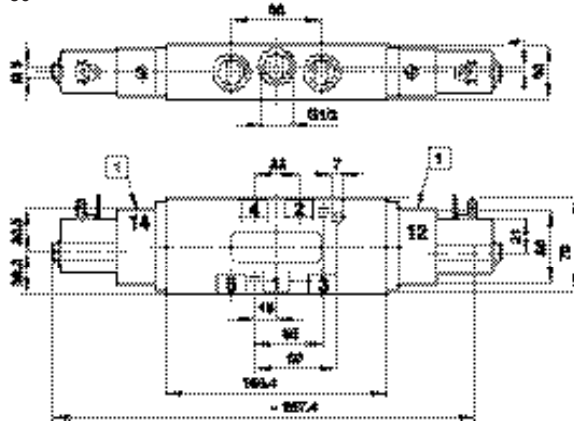
In-line valves

Solenoid and pilot actuated

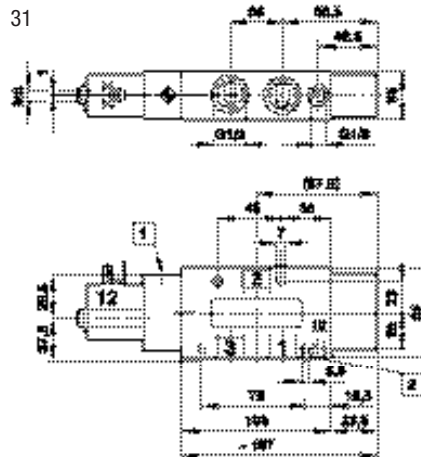
Rest position and impulse versions

3/2, 5/2, 5/3 and 2 x 3/2

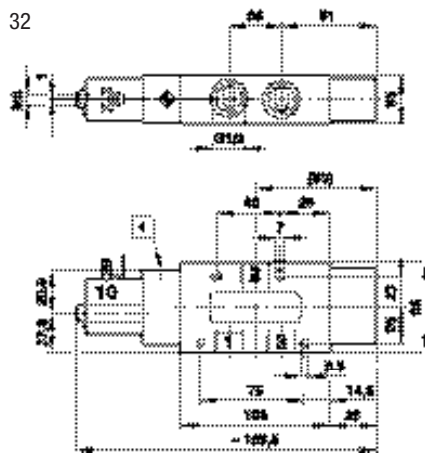
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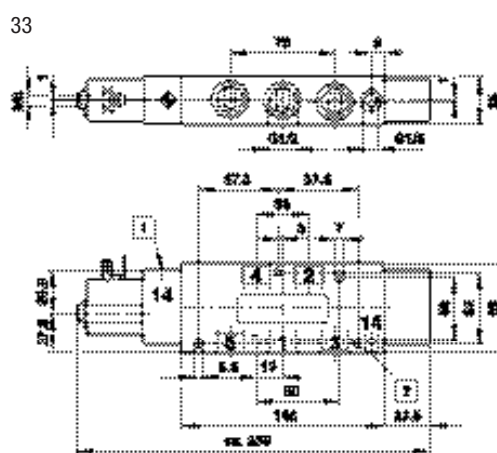
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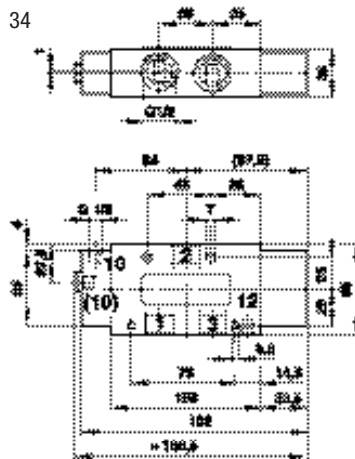
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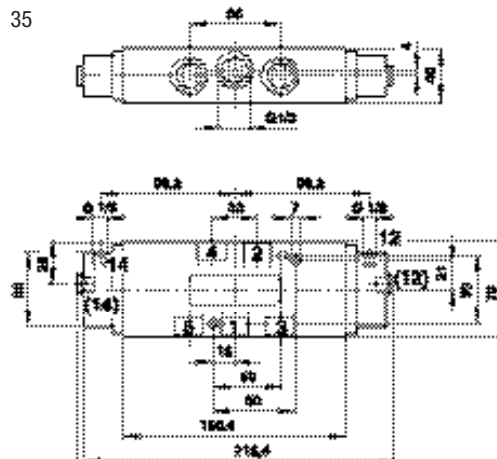
33



34



35



V60-63 Series

In-line valves

Solenoid and pilot actuated

Rest position and impulse versions

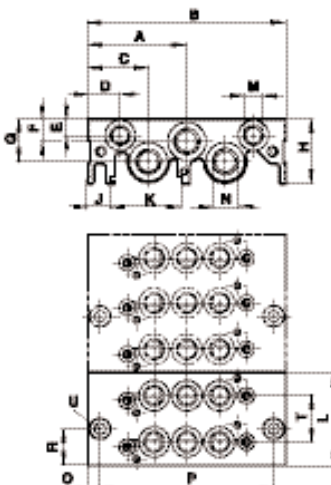
3/2, 5/2, 5/3 and 2 x 3/2

Manifold system for 2 x 3/2, 5/2, 5/3 valves, solenoid and pilot operated

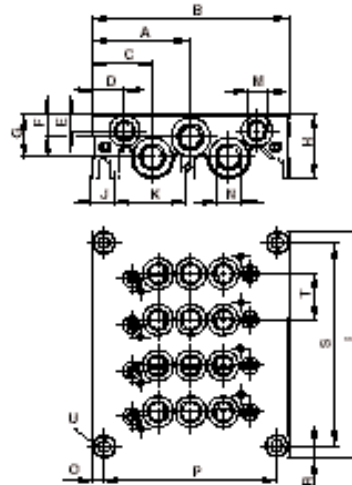
Manifold plate

Valve ports	V60 Model	kg	V61 Model	kg	V62 Model	kg
2	2221002 0000 00000	0,23	2221102 0000 00000	0,28	2221202 0000 00000	0,50
3	2221003 0000 00000	0,28	2221103 0000 00000	0,45	2221203 0000 00000	0,85
4	2221004 0000 00000	0,61	2221104 0000 00000	0,72	2221204 0000 00000	1,25
6	2221006 0000 00000	0,86	2221106 0000 00000	1,02	2221206 0000 00000	1,79
8	2221008 0000 00000	1,11	2221108 0000 00000	1,32	2221208 0000 00000	2,33
10	2221010 0000 00000	1,36	2221110 0000 00000	1,62	2221210 0000 00000	2,87
12	2221012 0000 00000	1,61	2221112 0000 00000	1,92	2221212 0000 00000	3,41
14	2221014 0000 00000	1,86	2221114 0000 00000	2,22	2221214 0000 00000	3,95
16	2221016 0000 00000	2,11	2221116 0000 00000	2,52	2221216 0000 00000	4,49
18	2221018 0000 00000	2,36	2221118 0000 00000	2,82	2221218 0000 00000	5,03
20	2221020 0000 00000	2,61	2221120 0000 00000	3,12	2221220 0000 00000	5,57

Manifold plate 2 stations + 3 stations



Manifold plate 4 stations - 20 stations



Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U
V60 2 stations	49	98	30	16	8	11	21	32	11	35,5	46	G 1/8	G 1/4	6	86	28	—	23	for M5
V60 3 stations	49	98	30	16	8	11	21	32	11	35,5	69	G 1/8	G 1/4	6	86	28	—	23	for M5
V60 4-20 stations	49	98	30	16	8	11	21	32	11	35,5	(x-23)+23	G 1/8	G 1/4	6	86	6,5	(x-23)+10	23	for M5
V61 2 stations	52	104	26	9	8	13	21	33	10	35,5	52	G 1/8	G 3/8	40	24	26	—	26	for M5
V61 3 stations	52	104	26	9	8	13	20	33	10	35,5	78	G 1/8	G 3/8	40	24	52	—	26	for M5
V61 4-20 stations	52	104	26	9	8	13	20	33	10	35,5	(x-26)+23	G 1/8	G 3/8	40	24	6,5	(x-26)+10	26	for M5
V62 2 stations	60	120	29	9	8	15	22	38	13	35,5	70	G 1/8	G 1/2	44	32	35	—	35	for M6
V62 3 stations	60	120	29	9	8	15	22	38	13	35,5	105	G 1/8	G 1/2	44	32	70	—	35	for M6
V62 4-20 stations	60	120	29	9	8	15	22	38	13	35,5	(x-35)+26	G 1/8	G 1/2	44	32	7	(x-35)+12	35	for M6