

Complementary valves: shuttle, quick exhaust and check valves

DESCRIPTION

Complementary valves are very important components of the pneumatic circuits. This group includes the:

- **SHUTTLE VALVES:** these valves are used when there is the necessity to convey, in one pipeline, two pneumatic flows coming from two different pipelines without any interference; in fact the compressed air flows from one of the two inlet ports to the working port while the second inlet port is excluded.

- **QUICK EXHAUST VALVES:** air flows from the inlet port to the working port while the exhaust port is closed. By shutting off the inlet port, the compressed air from the working port is exhausted through the exhaust port.

- **CHECK VALVES:** these valves are used to prevent loss of pressure in a pipeline when the inlet is connected to the exhaust; the compressed air can flow freely from the inlet to the working port while the opposite direction is blocked.



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SHUTTLE VALVES SERIES DS

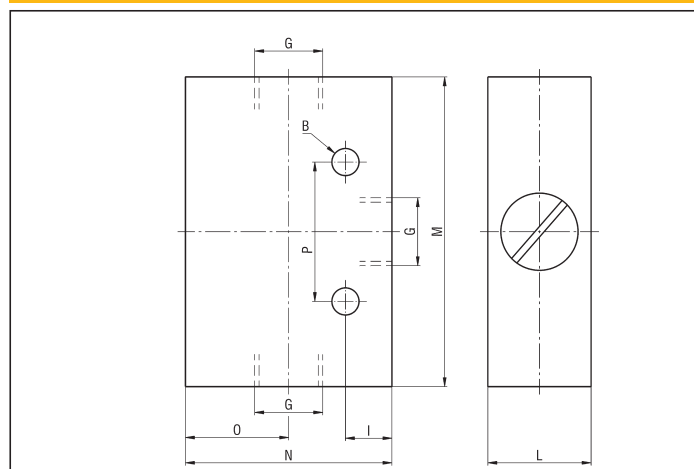
TECHNICAL DATA

Operating pressure	0 ÷ 12 bar
Working temperature	0 ÷ +80° C (-20° C with dry air)
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated
Port size	G 1/8 - G 1/4 - G 3/8 - G 1/2

MATERIALS

Body	Aluminium alloy
Seals	NBR rubber

DIMENSIONS AND WEIGHTS DS



Symbol	B	I	L	M	N	O	P	Flow rate at 6 bar $\Delta P=1$ bar (NI/min)	Pmin (bar)	Weight (g)	G	TYPE
	4,2	6	16	46	31	13	22	700	0,2	60	G 1/8	DS8
	5,2	8	20	60	40	17,5	27	1700	0,4	125	G 1/4	DS4
	6,4	10	25	80	50	21	38	3400	0,3	235	G 3/8	DS3
	6,4	12	30	100	60	26	48	5000	0,6	435	G 1/2	DS2

QUICK EXHAUST VALVES SERIES D3/

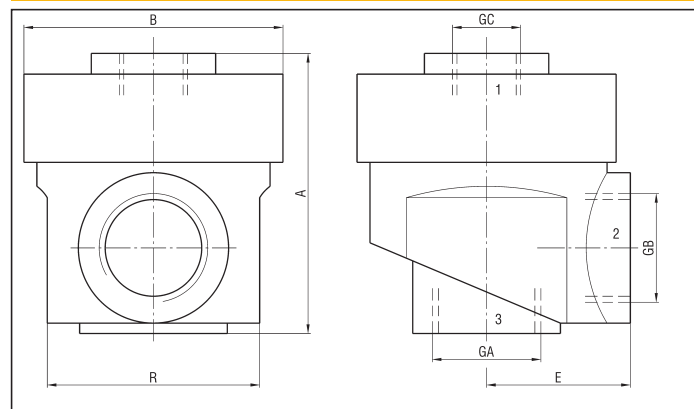
TECHNICAL DATA

Operating pressure	0 ÷ 12 bar
Working temperature	0 ÷ +80° C (-20° C with dry air)
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated
Port size	G 1/4 - G 1/2 - G 3/4

MATERIALS

Body	Aluminium alloy
Seals	NBR rubber
Bottom	Aluminium alloy

DIMENSIONS AND WEIGHTS D3/



Symbol	A	B	E	R	Flow rate from 1 to 2 at 6 bar $\Delta P=1$ bar (NI/min)	Flow rate from 2 to 3 at 6 bar free exhaust (NI/min)	Pmin (bar)	Weight (g)	GA	GB	GC	TYPE
	38	35	19,5	27	520	2300	0,2	70	G 1/4	G 1/4	G 1/8	D3/4
	43	35	19,5	27	610	2300	0,2	75	G 1/4	G 1/4	G 1/4	D3/4B
	54	50	27,5	41	1520	4300	0,2	135	G 1/2	G 1/2	G 1/4	D3/2
	58	50	27,5	41	2220	4300	0,2	140	G 1/2	G 1/2	G 1/2	D3/2B
	82	82	44	70	4400	6000	0,2	510	G 3/4	G 3/4	G 1/2	D3/15

Complementary valves: check and slide valves, distribution frames

CHECK VALVES SERIES U

TECHNICAL DATA		MATERIALS		DIMENSIONS AND WEIGHTS U				
Operating pressure	0 ÷ 12 bar	Body	Anodized aluminium					
Working temperature	0 ÷ +80° C (-20° C with dry air)	Piston	Brass					
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated	Seals	NBR rubber					
Port size	G 1/8 - G 1/4 - G 1/2 - G 1	Spring	Stainless steel					
Symbol	CH	A	Q	Flow rate at 6 bar ΔP=1 bar (NI/min)	Pmin (bar)	Weight (g)	G	TYPE
	13	15	34	70	0,2	25	G 1/8	U8
	19	21	48	700	0,7	75	G 1/4	U4
	19	21	48	725	0,2	75	G 1/4	U4/SM
	27	30	66	2750	0,2	170	G 1/2	U2
50	50	110	5100	0,2	1000	G 1	U1	
	19	21	48	800	0,2	75	G 1/4	U4/SM2

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SLIDE VALVES SERIES VC

TECHNICAL DATA		MATERIALS		DIMENSIONS AND WEIGHTS VC		
Operating pressure	0 ÷ 16 bar	Body	Nickel-plated brass			
Working temperature	0 ÷ +80° C (-10° C with dry air)	Slide	Anodized aluminium			
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated	Seals	NBR rubber			
Port size	G 1/8 - G 1/4 - G 3/8 - G 1/2					
CH	B	Flow rate at 6 bar ΔP=1 bar (NI/min)	D	Weight (g)	G	TYPE
14	25	700	48	54	G 1/8	VC-01
17	30	1500	58	102	G 1/4	VC-02
22	35	2200	68	153	G 3/8	VC-03
27	40	3400	80	204	G 1/2	VC-04

DISTRIBUTION FRAMES SERIES RX

TECHNICAL DATA		DIMENSIONS AND WEIGHTS RX							
Fluid	Air, oil, water								
Port size	G 1/8 - G 1/4 - G 3/8 - G 1/2								
MATERIALS									
Body	Anodized aluminium alloy								
B	C	D	E	F	G	H	A	Weight (g)	TYPE
31	23	22	4,5	4	4,3	16	G 1/8	35	RX8
40	30	27	6,5	5	5,3	20	G 1/4	70	RX4
50	38	39	5,5	6	6,3	25	G 3/8	130	RX3
50	38	39	5,5	6	6,3	25	G 1/2	115	RX2

DIMENSIONS AND WEIGHT RX8/6

		WEIGHT 110 g
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series EL

Complementary valves: pneumatic logic elements

DESCRIPTION

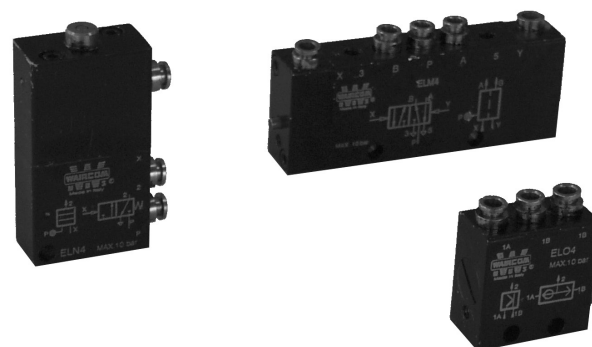
Pneumatic logic elements series "EL" are produced in the following No.5 basic functions: OR, AND, YES, NOT and MEMORY, with push-in fittings for pipe Ø 4 mm, and the pressure indicator is on body valve as standard. These elements can be mounted both separately (line mounted thanks to the No.2 holes on body valve) than on manifold bracket. The pneumatic logic element NOT is a threshold component and the pressure triggering value is 0,6 bar (at 6 bar). They are in compliance with ATEX directive, 2GD category, upon request.

TECHNICAL DATA

Operating pressure	1,5 ± 10 bar
Working temperature	0 ÷ +60 °C (-20 °C with dry air)
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated
Port size	Push-in fittings for pipe Ø 4 mm
Rated flow rate	90 NI/min

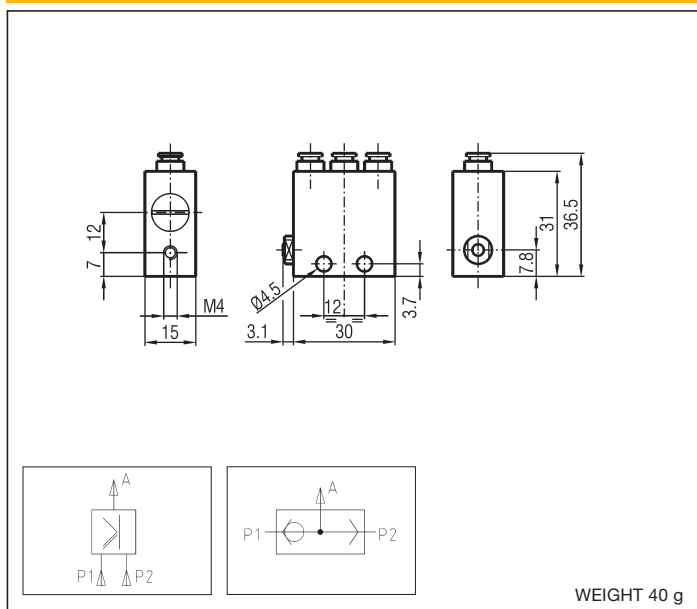
MATERIALS

Body	Anodized aluminium alloy
Bushing and guide	Nickel - plated brass
Springs	Stainless steel
Seals	NBR rubber
Spool	Anodized aluminium alloy
Connections	Nickel - plated brass, plastic material

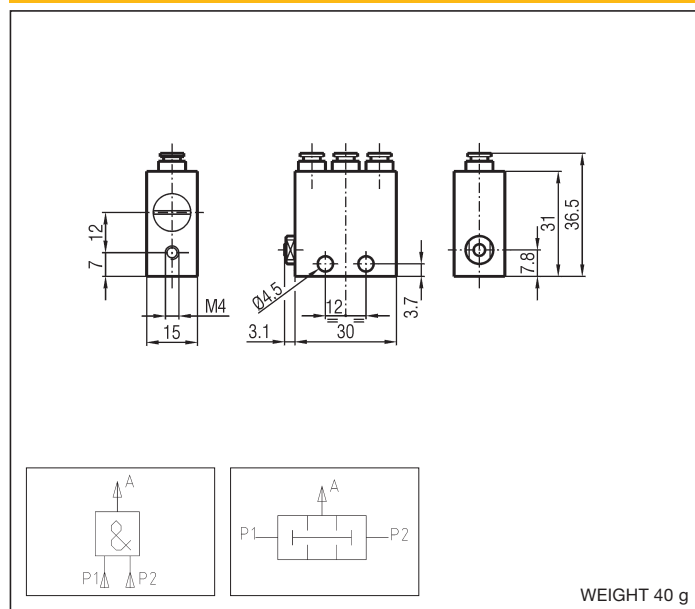


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LOGIC ELEMENT - ELO4 (OR - logical sum)*



LOGIC ELEMENT - ELA4 (AND - logical multiplication)*



*/EX Consistent with the ATEX directive II 2GD c T5 T100°C -20°C ≤ Ta ≤ 60°C E.G.: ELO4/EX

Complementary valves:
pneumatic logic elements

series **EL**

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LOGIC ELEMENT - ELY4 (YES - affirmation)*

WEIGHT 82 g

LOGIC ELEMENT - ELN4 (NOT - negation)*

WEIGHT 82 g

LOGIC ELEMENT - ELM4 (memory)*

WEIGHT 110 g

BRACKET - ELSQ

WEIGHT 30 g

*/EX Consistent with the ATEX directive II 2GD c T5 T100°C -20°C ≤ Ta ≤ 60°C E.G.: ELY4/EX

series UR

Complementary valves:
flow regulators
G 1/8 - G 1/4 - G 1/2

DESCRIPTION

Flow regulators series "UR" are produced in three different versions, unidirectional (type "URG") - bi-directional (type "URF"), to have a precision in-line regulation; unidirectional (type "URE"), when it's necessary a standard in-line regulation with reduced dimensions, and in the silenced exhaust version (type "URS"). In-line precision flow regulators type "URG"- "URF" are available in different adjustment scale in the size G 1/8 (see the flow charts).



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IN-LINE PRECISION FLOW REGULATORS TYPE URG - URF

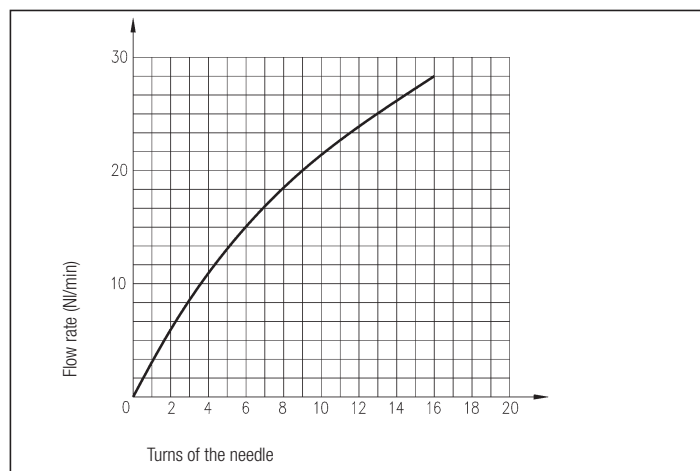
TECHNICAL DATA

Operating pressure	0 ÷ 12 bar
Working temperature	0 ÷ +80 °C (-20 °C with dry air)
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated
Port size	G 1/8 - G 1/4 - G 1/2

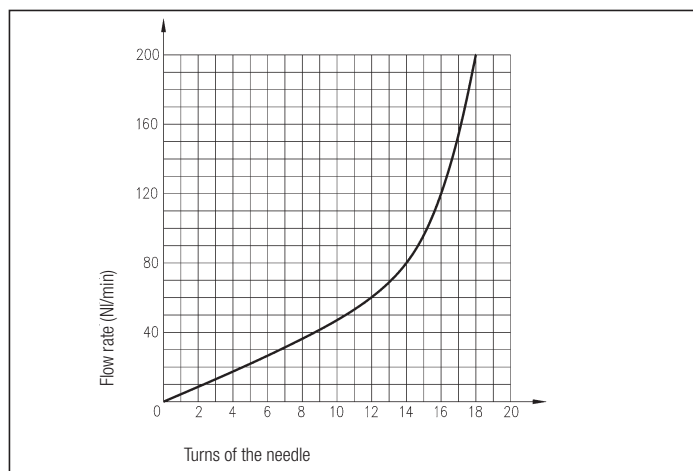
MATERIALS

Body	Anodized aluminium alloy
Seals	NBR rubber
Regulation needle	Aluminium (stainless steel for "URG" - "URF 8/1")
Needle guide	Brass
Nuts	Brass

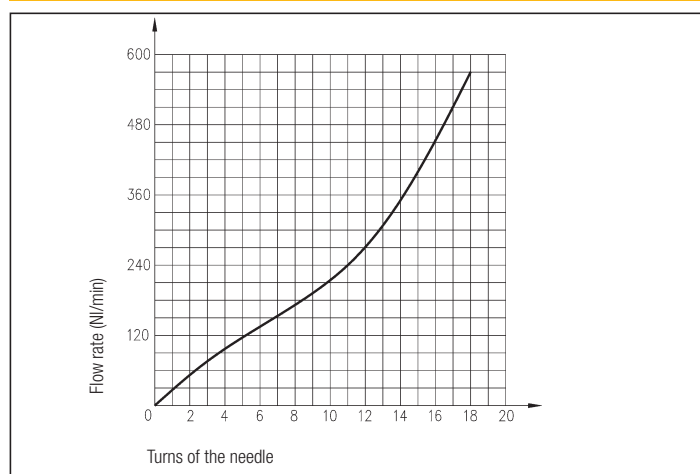
FLOW CHART AT 6 BAR - UR 8/1



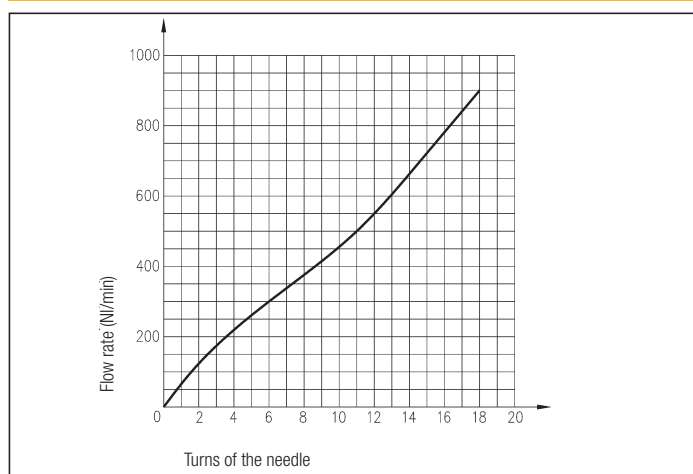
FLOW CHART AT 6 BAR - UR 8/2



FLOW CHART AT 6 BAR - UR 8/5



FLOW CHART AT 6 BAR - UR 4/10

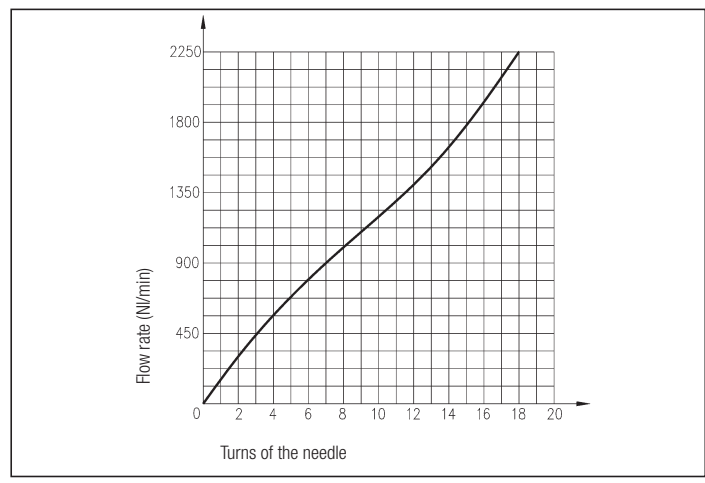


**Complementary valves:
flow regulators
G 1/8 - G 1/4 - G 1/2**

series UR

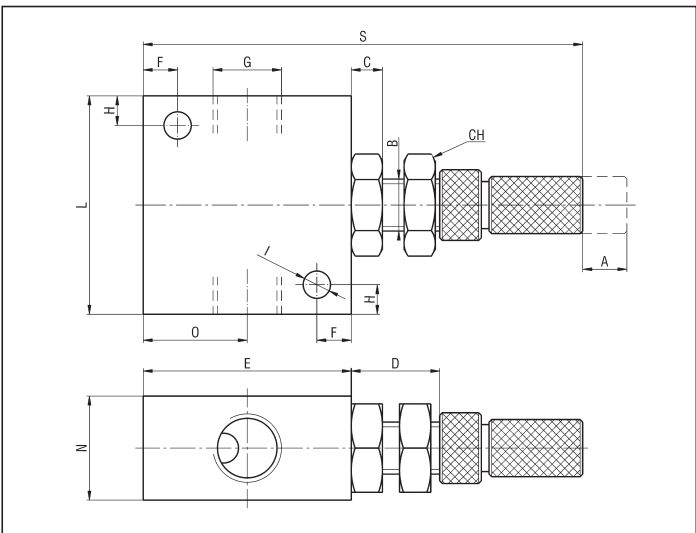
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FLOW CHART AT 6 BAR - UR 2/25



Symbol	Nominal diameter (mm)	Port size	TYPE
	0,9	G 1/8	URG8/1
	2	G 1/8	URG8/2
	5	G 1/8	URG8/5
	7,2	G 1/4	URG4/10
	12	G 1/2	URG2/25
	0,9	G 1/8	URF8/1
	2	G 1/8	URF8/2
	5	G 1/8	URF8/5
	7,2	G 1/4	URF4/10
	12	G 1/2	URF2/25

DIMENSIONS AND WEIGHTS URG - URF



A	B	C	CH	D	E	F	H
6	M12x0,75	4	14	12,5	31	4,5	5,5
8,5	M15x0,75	5,5	17	17	40	6,5	6
13	M25x1,5	7	30	22	65	8,5	12,5

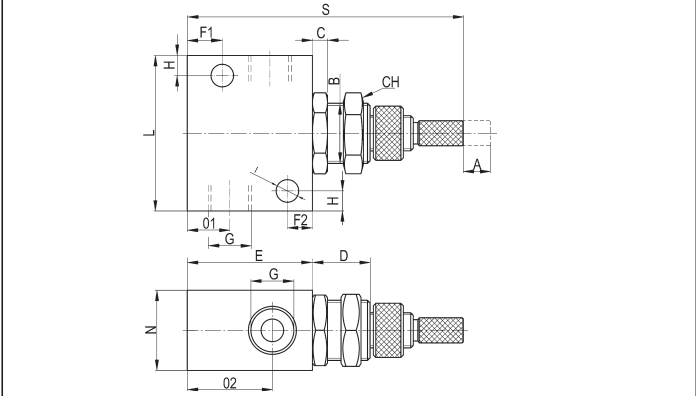
I	L	N	O	S	Weight (g)	G
4,3	34	16	15,5	65	60	G 1/8
5,25	42	20	20	84,5	120	G 1/4
6,25	69	35	32,5	127	540	G 1/2

IN LINE STANDARD FLOW REGULATORS TYPE URE

Symbol	A	B	C	CH	D	E	F1	F2	H
	10	M12X0,75	3	14	11	25	7	5	4
	13	M15X0,75	5	23	16	45	6,5	6,5	6,5

I	L	N	O1	O2	S	Weight (g)	G	TYPE
4,5	31	16	8,5	17	55	55	G 1/8	URE8
5,3	56	25	13,5	26	88,5	101	G 1/2	URE2

DIMENSIONS AND WEIGHTS URE



SILENCED EXHAUST FLOW REGULATORS TYPE URS

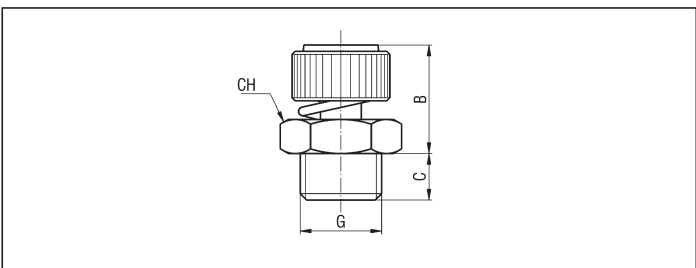
TECHNICAL DATA

Operating pressure	0 ÷ 12 bar
Working temperature	0 ÷ +80° C (-20° C with dry air)
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated
Port size	G 1/8 - G 1/4 - G 3/8 - G 1/2

MATERIALS

Body	Brass
Silencer	Sintered bronze
Seals	NBR rubber

DIMENSIONS AND WEIGHTS URS



Symbol	B	C	CH	Weight (g)	G	TYPE
	15,5	6	12	15	G 1/8	URS8/3
	17,5	8	16	25	G 1/4	URS4/5
	20	9	20	40	G 3/8	URS3/7
	22,5	10,5	22	70	G 1/2	URS2/9

series WB

Complementary valves:
block valves
G 1/8 - G 1/4 - G 1/2

DESCRIPTION

Block valves series "WB" are produced in the 2/2 - G 1/8, G 1/4 and G 1/2 monostable pneumatic functions in both the uni- and bi-directional versions. The working of the block valve consists in avoiding unexpected depressurisation of the cylinder's chamber due to lack of compressed air at the piloting port. For a correct functioning of the block valves we suggest to mount them directly on the cylinder.



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TECHNICAL DATA

Operating pressure	0 ÷ 10 bar
Minimum piloting pressure (at 10 bar)	G 1/8 = 2,5 bar G 1/4 = 4 bar G 1/2 = 5 bar
Working temperature	0 ÷ +70 °C (-10 °C with dry air)
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated
Port size	G 1/8 - G 1/4 - G 1/2
Pneumating piloting port size	G 1/8
Nominal diameter	G 1/8 = 5 mm G 1/4 = 7 mm G 1/2 = 12 mm
Flow rate at 6 bar (with ΔP = 1 bar)	G 1/8 = 500 NI/min G 1/4 = 700 NI/min G 1/2 = 1900 NI/min

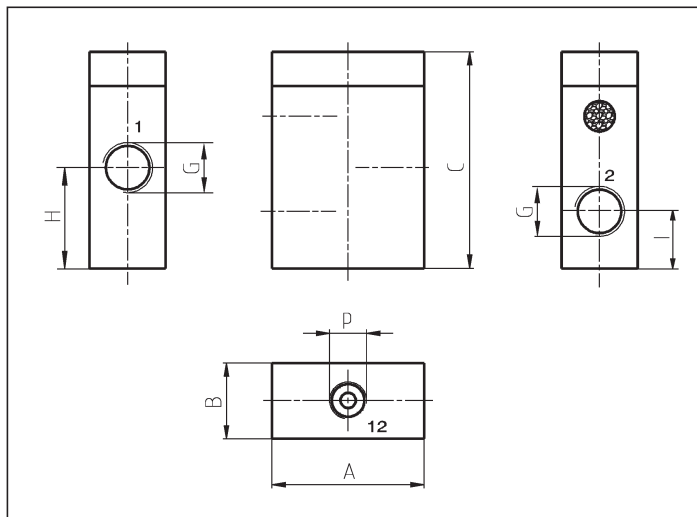
MATERIALS

Control rod	Anodized aluminium alloy
Body	Anodized aluminium alloy
Spring	Stainless steel
End plug	Nick-plated brass
Seals	NBR rubber
Washer	Brass

SPARE PARTS

SEALS KIT	
G 1/8	WB/SG/8
G 1/4	WB/SG/4
G 1/2	WB/SG/2

DIMENSIONS AND WEIGHTS



Symbol	A	B	C	H	I	P	Weight (g)	G	TYPE
	31	16	47	21,5	11,5	G 1/8	61	G 1/8	WB8U
	40	20	57	26,5	15		120	G 1/4	WB4U
	50	25	69	34,5	18		220	G 1/2	WB2U
	31	16	47	21,5	11,5	G 1/8	61	G 1/8	WB8B
	40	20	57	26,5	15		120	G 1/4	WB4B
	50	25	69	34,5	18		220	G 1/2	WB2B

DESCRIPTION OF THE CONNECTION

1 = INPUT
2 = CYLINDER
12 = PILOTING

Complementary valves:
amplifier valves

series **XVF**

DESCRIPTION

The type "XVF4" identifies a 3/2 N.C. amplifier valve that changes low pressure signals into pneumatic signals (1 ÷ 8 bar). Valve type "XVF5" is instead a 3/2 N.O. amplifier valve that changes negative pneumatic signals into pneumatic signals (1 ÷ 7 bar). Both of them are suitable to pilot directly the valves series "UDS" and "UK" with the same mounting than solenoid valves series "UL". For single mounting there is the sub-base type "XVB" (see on page 2.11) while for manifold mounting there are the bases type "ULP" (see on page 2.10).



TECHNICAL DATA

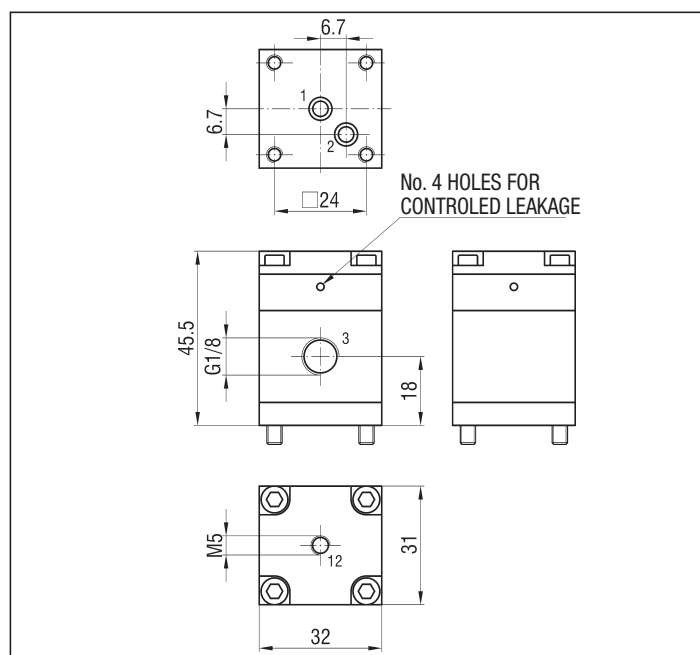
Operating pressure	XVF4: 1 ÷ 8 bar XVF5: 1 ÷ 7 bar
Working temperature	0 ÷ +60 °C (10 °C)
Fluid	Compressed air, filtered, continuous lubricated, unlubricated or dry lubricated
Piloting pressure	XVF4: 500 mbar XVF5: -500 mbar
Maximum frequency	50 Hz
Flow rate	500 NI/min a 6 bar
Controlled leakage consumption	1,4 NI/min a 7 bar
Piloting hole	M5

MATERIALS

Control rod	Aluminium
Body	Anodized aluminium alloy
Springs	Phosphor bronze
Seals	NBR rubber
Washer	Aluminium
Fixing screws	White galvanized steel

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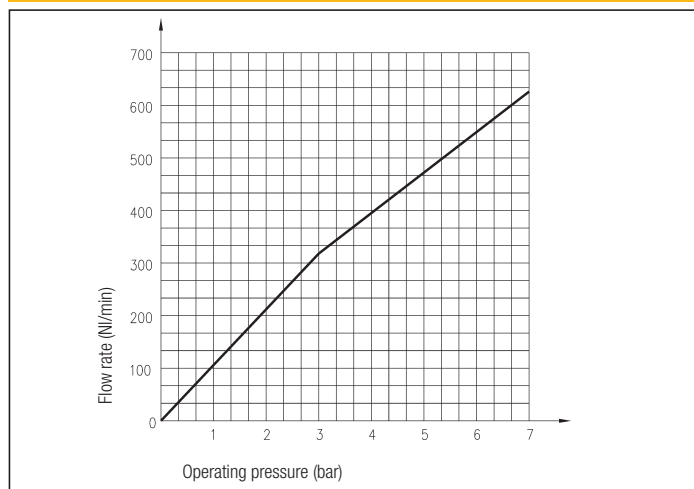
DIMENSIONS - XVF



SPARE PARTS

SEALS KIT	
XVF	XVF/SG/4-5

FLOW CHART - XVF



3 PORT

Symbol	Function	Controls		Response times at 6 bar (ms)		Flow rate at 6 bar ΔP = 1 bar (NI/min)	Weight (g)	TYPE
		Pilot	Return	Pilot	Return			
	3/2 N.C.	Pneumatic	Mechanical spring	26,64	38,42	500	10,5	XVF4
	3/2 N.O.	Vacuum	Mechanical spring	21,14	32,66	500	10,5	XVF5