Mechanically actuated valves

FESTO

Key features

V/O-3-1/8

R/O-3-PK-3

L/O-3-PK-3

RW-3-M5

FVS-3-1/8

LS-3-1/8

Innovative

- Small and compact for a wide range of pneumatic applications
- Wide range of selectable valve functions; 3/2-way, 4/2-way and 5/2-way functions
- With flow rates of up to 600 l/min, the valves offer outstanding pneumatic performance for a wide range of applications
- Lightweight
- Minimal actuating forces

Versatile

- Flexibility of the pneumatic working ports provides a practical solution to different requirements
- Round silencer for ducted exhaust air
- Suitable for vacuum in some cases
- Reverse operation possible in some cases
- Actuation: direct and piloted
- Pressure range from vacuum to 10 bar possible.
- Design:
  - Stem actuated valve
  - Swivel lever valve
  - Roller valve, toggle lever valve
  - Whisker valve
  - Roller actuated valve

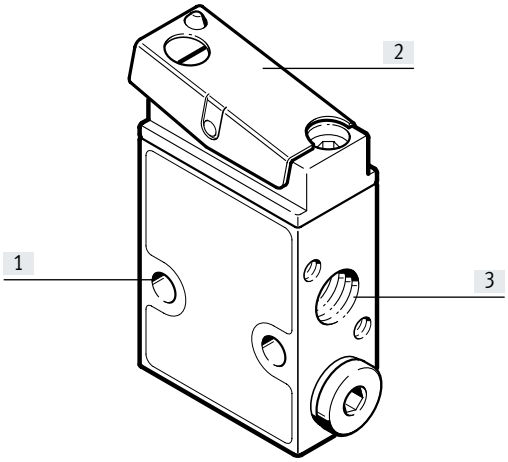
Operational safety

- Durable with proven piston slide and piston poppet valves
- Sturdy thanks to metal or plastic housing and connecting thread or connector

Easy to install

- Front panel mounting or mounting on bracket

Key features



[1] Fast mounting:
screwed directly via through-hole, front panel mounting possible in some cases

[2] Actuated via plunger, swivel lever, roller, toggle lever, whisker, roller plunger

[3] Practical connection with threaded connection or connecting pieces

Equipment options

3/2-way valve, monostable

- Normally open/closed
- Mechanical spring
- Vacuum operation possible
- Directly controlled and pneumatically piloted
- Ducted exhaust air

4/2-way valves, monostable

- Mechanical spring
- Pneumatically piloted
- Ducted exhaust air

5/2-way valve, monostable

- Pneumatic spring/mechanical spring
- Vacuum operation possible
- Reversible in some cases
- Pneumatically piloted
- Ducted exhaust air

Valve selection → Internet: www.festo.com

You can order mechanically and manually operated directional control valves using the order code:

Ordering system for valves
→ Internet: mechanically and manually operated directional control valves

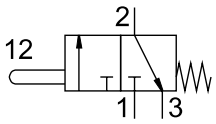
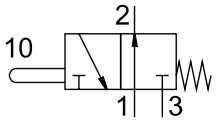
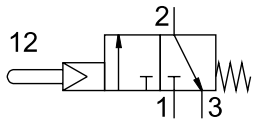
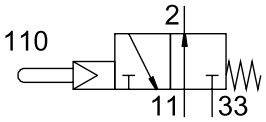
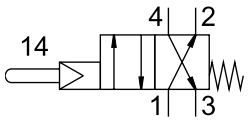
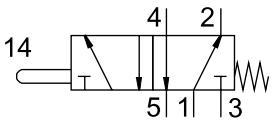
Key features – Pneumatic components

Mechanically actuated valves

Mechanically actuated valves are often used as "signal valves", and return a pneumatic signal to the controller. This signal, e.g. "end position reached", is transmitted via a stem or roller actuated valve.
This application sounds simple, but it is commonly used in smaller machines and in conveyor systems, e.g. to control simple clamping and locking processes in semi-automatic assembly and manufacturing. A modern design with a metal housing combines durability and functionality.
Benefits of mechanically actuated valves:

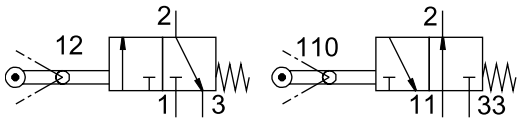
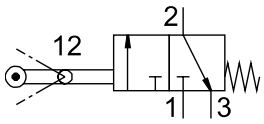
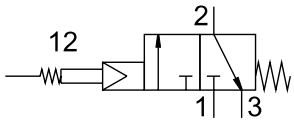
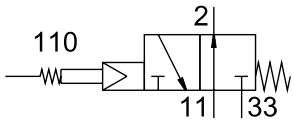
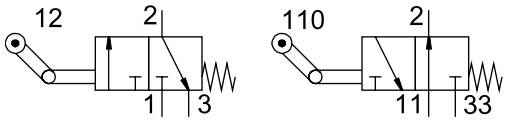
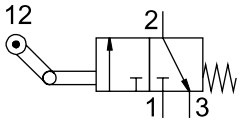
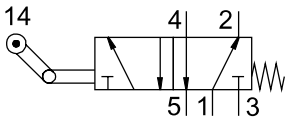
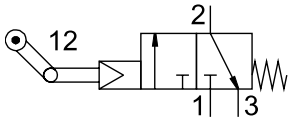
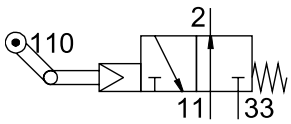
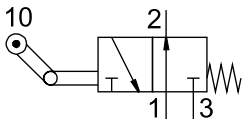
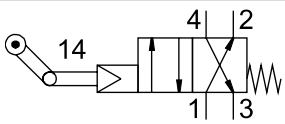
- No electronic controller required
- No programming required
- Easy to set up and connect
- Can be controlled and measured using sensors

Valve functions

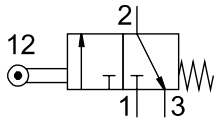
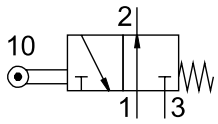
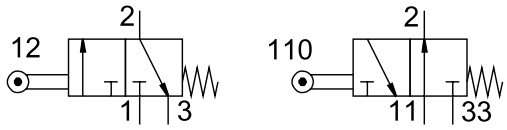
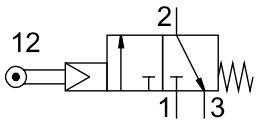
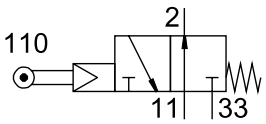
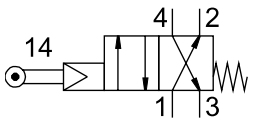
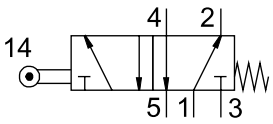
Circuit symbol	Type	Description
Stem actuated valve		
	V-3-M5 V-3-1/4-B V/O-3-PK-3	3/2-way valve, monostable • Normally closed • Mechanical spring return • Suitable for vacuum (not V/O-3-PK-3)
	VO-3-1/4-B	3/2-way valve, monostable • Normally open • Mechanical spring return • Suitable for vacuum
	V/O-3-1/8	3/2-way valve, monostable • Normally open/closed • Mechanical spring return • Suitable for vacuum
	VS-3-1/8	3/2-way valve, monostable • Normally closed • Pneumatically piloted, internal pilot air • Mechanical spring return
	VOS-3-1/8	3/2-way valve, monostable • Normally open • Pneumatically piloted, internal pilot air • Mechanical spring return
	VS-4-1/8	4/2-way valve, monostable • Pneumatically piloted, internal pilot air • Mechanical spring return
	V-5-1/4-B	5/2-way valve, monostable • Normally open/closed • Mechanical spring return • Suitable for vacuum

Key features – Pneumatic components

Valve functions

Circuit symbol	Type	Description
Swivel lever valve		
	RW/O-3-1/8 RW/O-3-1/8-S9 RW/O-3-PK-3	3/2-way valve, monostable • Normally open/closed • Mechanical spring return • Suitable for vacuum (only RW/O-3-1/8)
	RW-3-M5	3/2-way valve, monostable • Normally closed • Mechanical spring return • Suitable for vacuum
Whisker valve		
	FVS-3-1/8	3/2-way valve, monostable • Normally closed • Mechanical spring return • Pneumatically piloted, internal pilot air
	FVSO-3-1/8	3/2-way valve, monostable • Normally open • Mechanical spring return • Pneumatically piloted, internal pilot air
Toggle lever valve		
	L/O-3-PK-3	3/2-way valve, monostable • Normally open/closed • Mechanical spring return
	L-3-M5 L-3-1/4-B	3/2-way valve, monostable • Normally closed • Mechanical spring return • Suitable for vacuum
	L-5-1/4-B	5/2-way valve, monostable • Mechanical spring return • Suitable for vacuum
Toggle lever valve		
	LS-3-1/8	3/2-way valve, monostable • Normally closed • Mechanical spring return • Pneumatically piloted, internal pilot air
	LOS-3-1/8	3/2-way valve, monostable • Normally open • Mechanical spring return • Pneumatically piloted, internal pilot air
	LO-3-1/4-B	3/2-way valve, monostable • Normally open • Mechanical spring return • Suitable for vacuum
	LS-4-1/8	4/2-way valve, monostable • Mechanical spring return • Pneumatically piloted, internal pilot air

Key features – Pneumatic components

Valve functions – circuit symbol Circuit symbol	Type	Description
Roller lever, roller actuated valve		
	R-3-M5 R-3-1/4-B	3/2-way valve, monostable • Normally closed • Mechanical spring return • Suitable for vacuum
	RO-3-1/4-B	3/2-way valve, monostable • Normally open • Mechanical spring return • Suitable for vacuum
	R/O-3-PK-3	3/2-way valve, monostable • Normally open/closed • Mechanical spring return
	RS-3-1/8	3/2-way valve, monostable • Normally closed • Mechanical spring return • Pneumatically piloted, internal pilot air
	ROS-3-1/8	3/2-way valve, monostable • Normally open • Mechanical spring return • Pneumatically piloted, internal pilot air
	RS-4-1/8	4/2-way valve, monostable • Mechanical spring return • Pneumatically piloted, internal pilot air
	R-5-1/4-B	5/2-way valve, monostable • Mechanical spring return • Suitable for vacuum

Note

A filter must be installed upstream of valves operated in vacuum mode. This prevents any foreign matter in the intake air getting into the valve (e.g. when operating a suction cup).

Datasheet – Stem actuated valve, 80 ... 160 l/min standard nominal flow rate

- Flow rate
  80 ... 600 l/min

- Pressure
  –0.95 ... +10 bar

- Temperature range
  –10 ... +60°C

Mounting via through-hole

General technical data

Type		V-3-M5	V/O-3-PK-3	VS-3-1/8 VOS-3-1/8	VS-4-1/8	V/O-3-1/8	RW/O-3-1/8
Standard nominal flow rate 1 ⇢ 2	[l/min]	80		146 ... 154 (VS...) 141 ... 161 (VOS...)	140 ... 147	140	140
Valve function		3/2-way valve		3/2-way valve	4/2-way valve	3/2-way valve	
Exhaust air		–	–	Can be throttled		–	–
Design		Poppet valve, directly actuated		Poppet seat valve, piloted		Poppet valve, directly actuated	
Flow direction		–	–	Not reversible		–	–
Sealing principle		–	–	Soft		–	–
Mounting position		–	–	Any		–	–
Note on forced checking procedure		–	–	Switching frequency min. 1/year		–	–
Pneumatic port		M5	PK-3 [1]	G1/8	G1/8	G1/8	
Nominal width	[mm]	2.0	2.5	3.5	3.5	3.5	
Weight	[g]	25	20	110	220	90	150
Actuating force • at 6 bar	[N]	23.0	17.0	3.0	3.2	28.0	28.0
• with normally closed position	[N]	–	17.0	–	–	37.5	–
• with normally open position	[N]	–	24.0	–	–	–	–

1) PK-3=barbed connector for plastic tubing, nominal width 3 mm

Materials

Type	V-3-M5	V/O-3-PK-3	VS-3-1/8 VOS-3-1/8	VS-4-1/8	V/O-3-1/8	RW/O-3-1/8
Seal	NBR					
Housing	Die-cast zinc	POM	Anodised aluminium			
Note on materials	–	–	RoHS-compliant		–	–

Datasheet – Stem actuated valve, 80 ... 160 l/min standard nominal flow rate

Operating and environmental conditions							
Type		V-3-M5	V/O-3-PK-3	VS-3-1/8 VOS-3-1/8	VS-4-1/8	V/O-3-1/8	RW/O-3-1/8
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]					
Note on the operating/ pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)					
Operating pressure range	[MPa]	–	–	0.35 ... 0.8		–	–
	[bar]	–0.95 ... +8	0 ... 8	3.5 ... 8		–0.95 ... +8	–0.95 ... +8
Temperature of medium	[°C]	–10 ... +60					
Ambient temperature	[°C]	–10 ... +60	–	–10 ... +60			
Corrosion resistance class CRC[1)]		–	–	2		–	–

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Technical data – actuator attachment for swivel lever valve RW/O-3-1/8				
Swivel lever, type		ASK–02 (short)	ASL–02 (long)	ASS–02 (bar)
Max. actuating force	[N]	7	Depending on starting height	Depending on starting height
Weight	[g]	30	35	30

Materials - Swivel lever	
Swivel lever	Aluminium, steel

Datasheet – Stem actuated valve, 550 ... 600 l/min standard nominal flow rate

General technical data				
Type		V-5-1/4-B	VO-3-1/4-B	V-3-1/4-B
Standard nominal flow rate 1 ⇢ 2	[l/min]	550	600	
Valve function		5/2-way valve	3/2-way valve	
Design		Poppet valve, directly actuated	Poppet valve, directly actuated	Poppet valve, directly actuated
Pneumatic port		G1/4	G1/4	G1/4
Nominal width	[mm]	7.0	7.0	7.0
Weight	[g]	240	130	130
Actuating force at 6 bar	[N]	163.8 ... 200.2	115.2 ... 140.8	63 ... 77

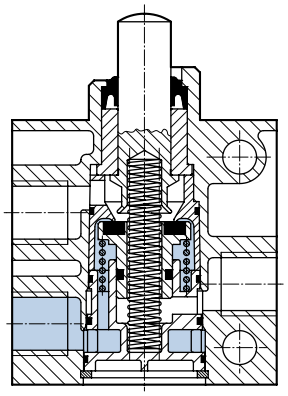
Materials	
Seal	NBR
Housing	Die-cast aluminium

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]
Note on the operating/ pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure range	[bar]	–0.95 ... +10
Temperature of medium	[°C]	–10 ... +60
Ambient temperature	[°C]	–10 ... +60

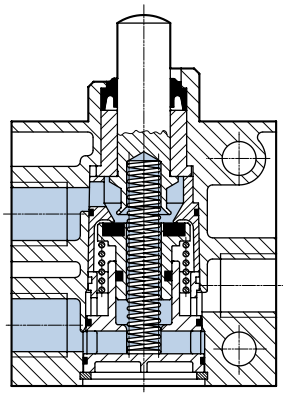
Sectional views

Sectional view

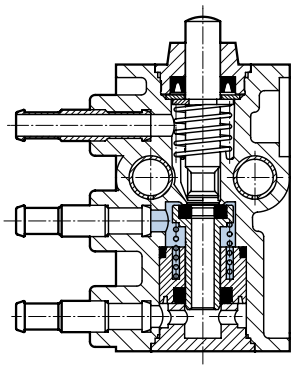
V-3-1/4-B, normally closed



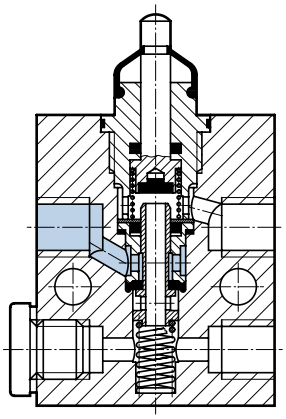
VO-3-1/4-B, normally open



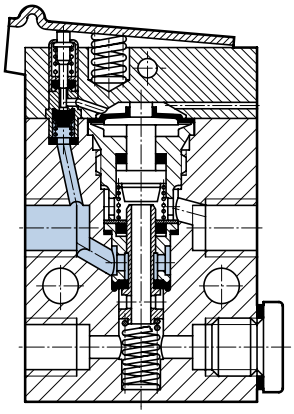
V/O-3-PK-3



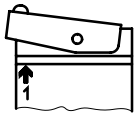
V/O-3-1/8



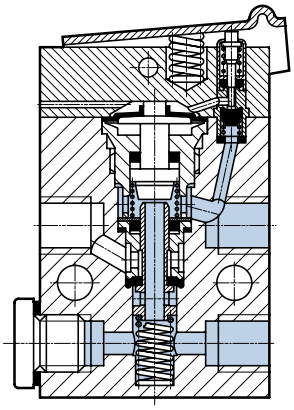
V ... -3-1/8, normally closed



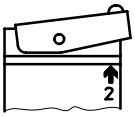
Actuator attachment on the left (number 1 on the attachment above number 1 on the housing)



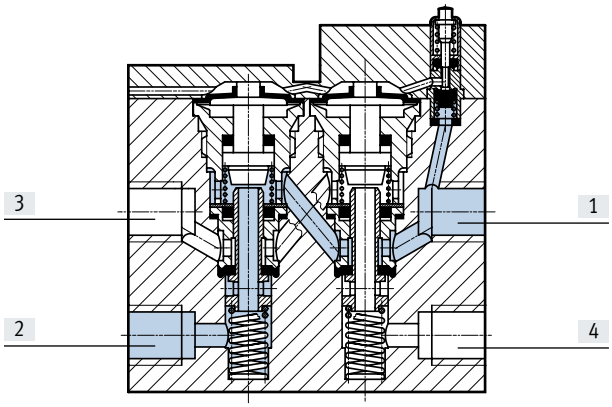
V ... -3-1/8, normally open



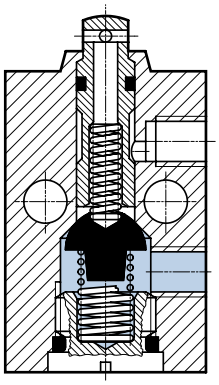
Actuator attachment on the right (number 1 on the attachment above number 2 on the housing)



VS-4-1/8



V-3-M5



[1] Supply port
[2], [4] Working port
[3] Exhaust port

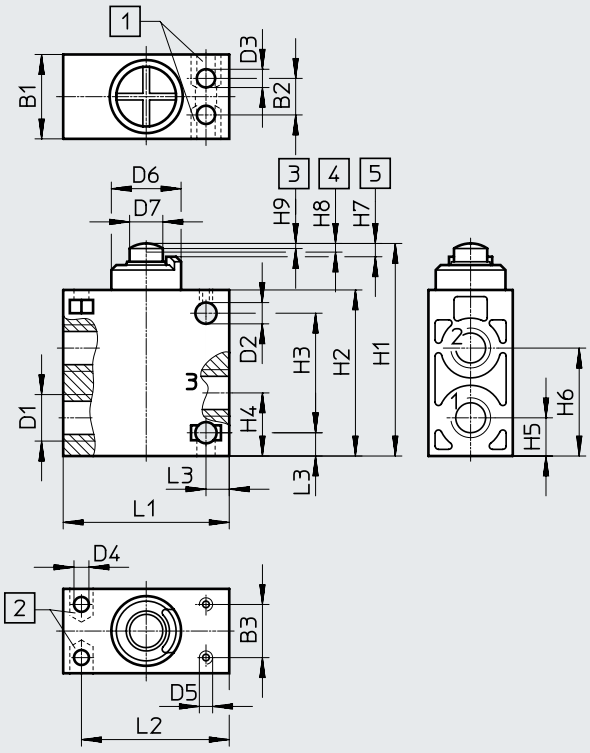
Note

The sectional views, shown on the stem actuated valve, are also generally applicable for roller lever valves, toggle lever valves and swivel lever valves. The function remains identical, only the operation with actuator attachments is different.

Datasheet

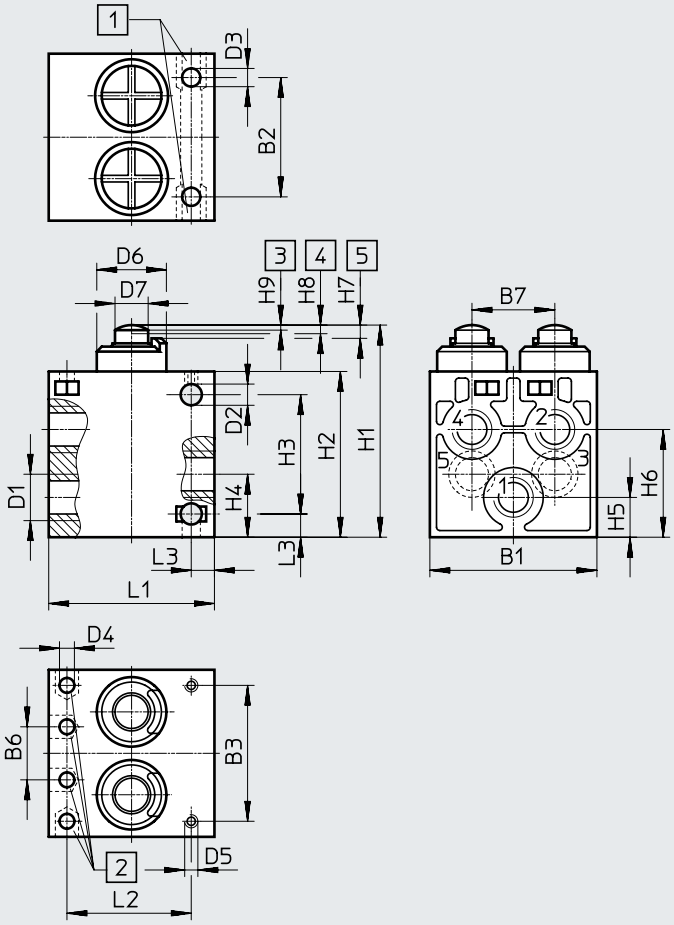
Dimensions Download CAD data ➔ www.festo.com

Stem actuated valve V-3-1/4-B, VO-3-1/4-B



[1] Retainer for M5 hex nut to DIN 934
[2] Retainer for M4 hex nut to DIN 934
[3] Opening start
[4] Max. opening
[5] Max. stroke

Stem actuated valve V-5-1/4-B



[1] Retainer for M5 hex nut to DIN 934
[2] Retainer for M4 hex nut to DIN 934
[3] Opening start
[4] Max. opening
[5] Max. stroke

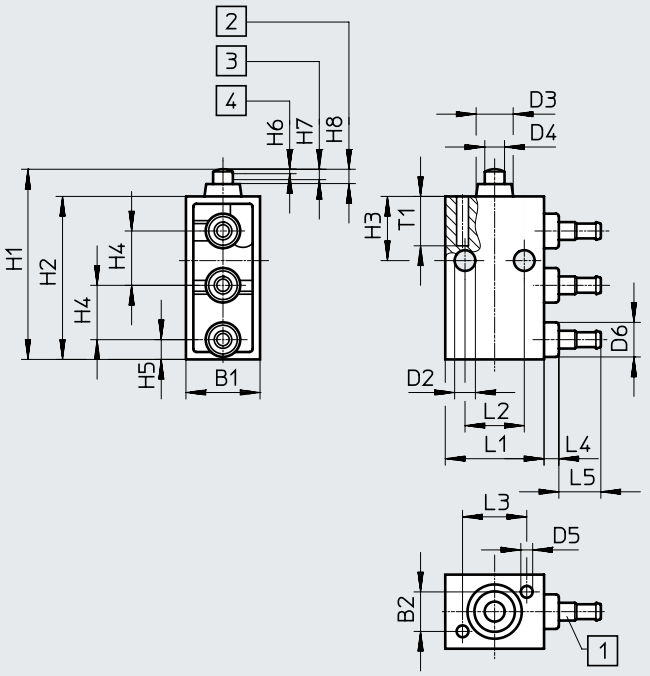
Stem actuated valve	B1	B2	B3	B6	B7	D1	D2 ø	D3 ø	D4 ø	D5	D6 ø	D7 ø
V-3-1/4-B, VO-3-1/4-B	25.4	11	16	–	–	G1/4	6.4	5.5	4.5	M4	21	10
V-5-1/4-B	50.4	36	41	16	25	G1/4	6.4	5.5	4.5	M4	21	10

Stem actuated valve	L1	L2	L3	H1	H2	H3	H4	H5	H6	H7	H8	H9
V-3-1/4-B, VO-3-1/4-B	50	44.5	7	64	50	36	19	11.5	32.5	4	2.6	1.7
V-5-1/4-B	50	37.5	7	64	50	36	19	11.5	32.5	4	2.6	1.7

Datasheet

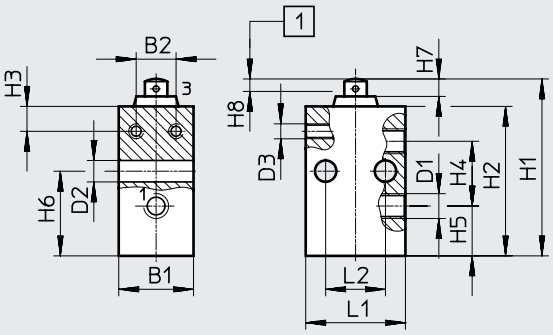
Dimensions Download CAD data ➔ www.festo.com

Stem actuated valve V/O-3-PK-3



[1] Barbed connector for tubing I.D. 3 mm
[2] Max. stroke
[3] Max. opening
[4] Opening start

Stem actuated valve V-3-M5



[1] Max. stroke

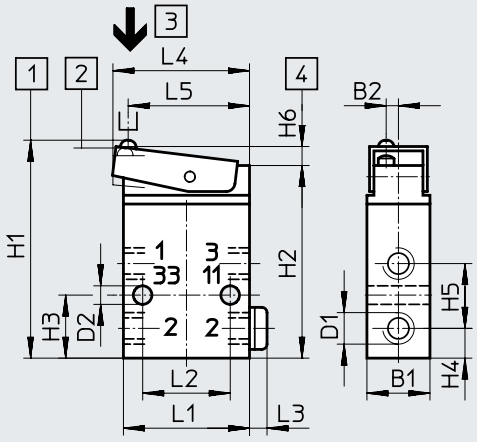
Stem actuated valve	B1	B2	D1	D2 ø	D3 ø	D3	D4 ø	D5 ø	D6 ø	T1
V/O-3-PK-3	15	8	–	4.3	7.5	–	4	2.4	7	10
V-3-M5	15	8	M5	4.3	–	M3	–	–	–	–

Stem actuated valve	L1	L2	L3	L4	L5	H1	H2	H3	H4	H5	H6	H7	H8
V/O-3-PK-3	20	12	13	3	8.5	38.5	33	13	11	4	0.9	2.1	2.9
V-3-M5	–	–	–	–	–	35.5	30	8	13	10	17	3.5	2.5

Datasheet

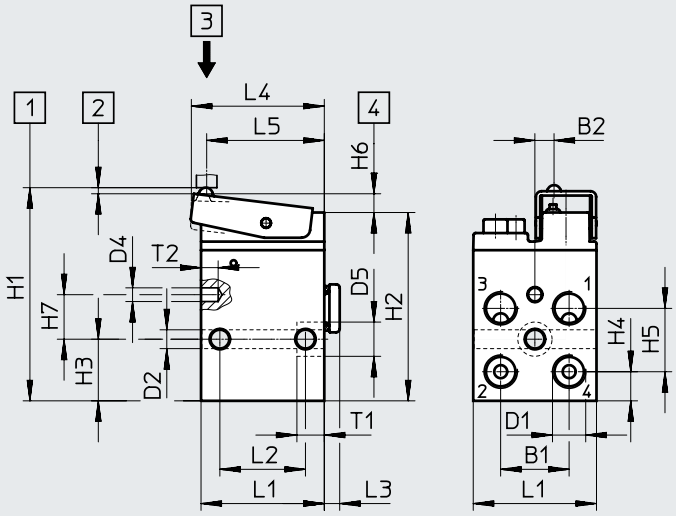
Dimensions Download CAD data ➔ www.festo.com

Stem actuated valve VS-3-1/8, VOS-3-1/8



[1] Initial position
[2] ON position
[3] Actuation direction
[4] Smallest cam clearance

Stem actuated valve VS-4-1/8



[1] Initial position
[2] ON position
[3] Actuation direction
[4] Smallest cam clearance

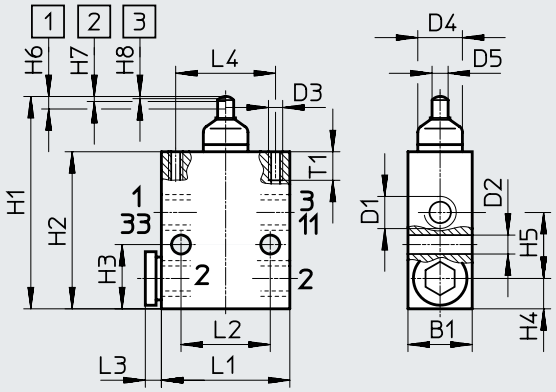
Stem actuated valve	B1	B2	D1	D2 ø	D4 ø	D5 ø	T1	T2
VS-3-1/8 VOS-3-1/8	18	3.5	G1/8	5.5	–	–	–	–
VS-4-1/8	20	5.5	G1/8	5.5	4	10	8	5

Stem actuated valve	L1	L2	L3	L4	L5	H1	H2	H3	H4	H5	H6	H7
VS-3-1/8 VOS-3-1/8	36	25	4.5	39	38.5	62.5	55	18	8.5	18.5	5.5	–
VS-4-1/8	36	25	4.5	39	35.5	62.5	55	18	8.5	18.5	5.5	13

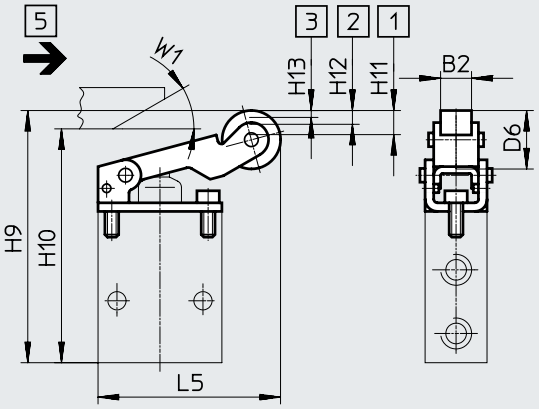
Datasheet

Dimensions Download CAD data ➔ www.festo.com

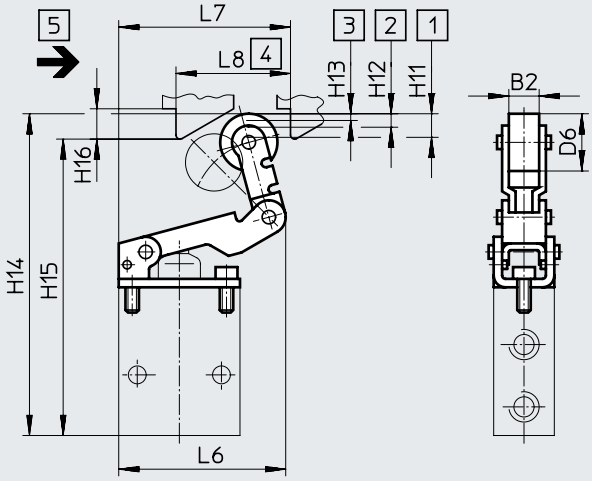
Stem actuated valve V/O-3-1/8



Actuator attachment roller lever AR-01 for stem actuated valve V/O-3-1/8



Actuator attachment roller lever with idle return AL-01 for stem actuated valve V/O-3-1/8



[1] Max. stroke
[2] Max. opening
[3] Opening start
[4] Min. actuation stroke
[5] Actuation direction

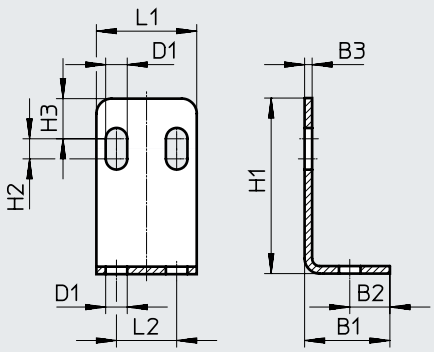
Stem actuated valve	B1	D1	D2 ø	D3	D4 ø	D5 ø	L1	L2	L3	L4	H1	H2	H3	H4	H5	H6	H7 ±0.2	H8 ±0.2	T1
V/O-3-1/8	18	G1/8	5.3	M4	12.5	4.5	36	25	4.5	28	59.5	44	18	8.5	18.5	3.5	1.4	0.6	8

Actuator attach-ment	B2	D6 ø	L5	L6	L7	L8	H9	H10 Min.	H11	H12 +0.2	H13 +0.2	H14	H15 Min.	H16	W1
AR-01	8	17	54	–	–	–	71	64	7	4	2	–	–	–	30°
AL-01	8	17	–	50.5	51	34	–	–	7	4	2	93.5	86.5	9	–

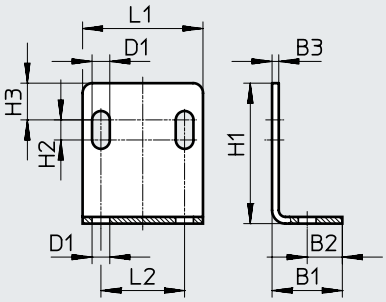
Datasheet

Dimensions Download CAD data ➔ www.festo.com

Mounting bracket HV-M5



Mounting bracket HV-1/8



Mounting bracket	B1	B2	B3	D1 ø	L1	L2	H1	H2	H3
HV-M5	17	8	1.5	4.3	20	12	35	4	8
HV-1/8	21	10.5	2	5.3	36	25	42	6	11

Ordering data

Nominal flow rate [l/min]	Valve function	Description	Mechanical reset	Normal position	Part no.	Type
Stem actuated valve						
80	3/2-way valve, monostable	Suitable for vacuum	■	Closed	**3626**	**V-3-M5**
		Suitable for vacuum	■	Open/closed	**10747**	**V/O-3-PK-3**
140 ... 147	4/2-way valve, monostable	–	■	–	**3394**	**VS-4-1/8**
140	3/2-way valve, monostable	Suitable for vacuum	■	Open/closed	**4938**	**V/O-3-1/8**
146 ... 154	3/2-way valve, monostable	–	■	Closed	**2334**	**VS-3-1/8**
141 ... 161	3/2-way valve, monostable	–	■	Open	**2952**	**VOS-3-1/8**
550	5/2-way valve, monostable	Suitable for vacuum	■	–	**6809**	**V-5-1/4-B**
600	3/2-way valve, monostable	Suitable for vacuum	■	Closed	**6808**	**V-3-1/4-B**
				Open	**9157**	**VO-3-1/4-B**

Datasheet – Swivel lever valve, 80 ... 140 l/min standard nominal flow rate

- Flow rate
  80 ... 140 l/min

- Pressure
  –0.95 ... +8 bar

- Temperature range
  –10 ... +60°C

Mounting via through-hole

General technical data				
Type		RW-3-M5	RW/O-3-PK-3	RW/O-3-1/8
Standard nominal flow rate 1 → 2	[l/min]	80	80	140
Valve function		3/2-way valve		
Design		Poppet valve, directly actuated		
Pneumatic port		M5	NW3 (barbed connector)	GÁ
Nominal width	[mm]	2	2.5	3.5
Weight	[g]	65	40	150
Actuating force at 6 bar	[N]	14.5	13.0 (RW) 16.0 (RWO)	28.0

Materials			
Type	RW-3-M5	RW/O-3-PK-3	RW/O-3-1/8
Seal	NBR	NBR	NBR
Housing	Die-cast zinc	POM	Anodised aluminium

Operating and environmental conditions				
Type		RW-3-M5	RW/O-3-PK-3	RW/O-3-1/8
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]		
Operating pressure range	[bar]	–0.95 ... +8	0 ... 8	–0.95 ... +8
Temperature of medium	[°C]	–10 ... +60		

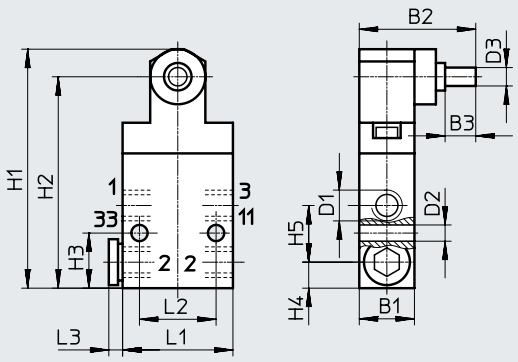
Technical data – actuator attachment for swivel lever valve RW/O-3-1/8					
Swivel lever, type		ASK–01 (short)	ASK–02 (short)	ASL–02 (long)	ASS–02 (bar)
Max. actuating force	[N]	–	7	Depending on starting height	Depending on starting height
Weight	[g]	20	30	35	30

Materials - Swivel lever				
Swivel lever, type	ASK–01 (short)	ASK–02 (short)	ASL–02 (long)	ASS–02 (bar)
Material	Die-cast zinc	Aluminium, steel		

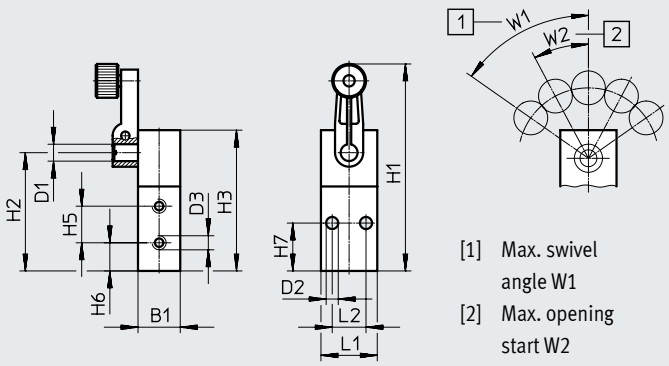
Datasheet

Dimensions Download CAD data ➔ www.festo.com

Swivel lever valve RW/O-3-1/8



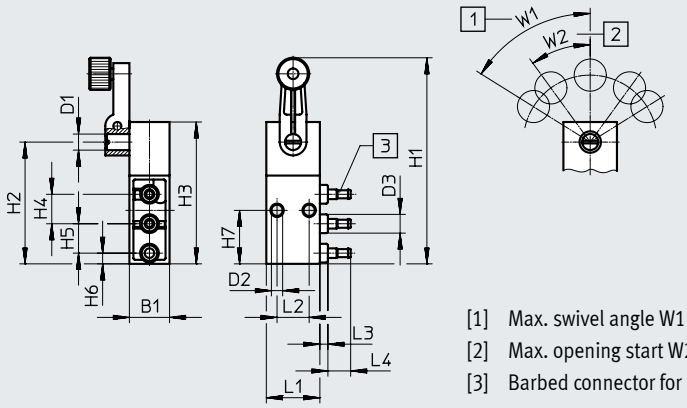
Swivel lever valve RW-3-M5



[1] Max. swivel angle W1
[2] Max. opening start W2

	B1	B2	B3	D1 f8	D2 ø	D3 ø	D3	L1	L2	L3	H1	H2	H3	H4	H5	H6	H7	W1	W2
RW/O-3-1/8	18	38	10	G1/8	5.3	6	–	36	25	4.5	78	69	18	8.5	18.5	–	–	–	–
RW-3-M5	15	–	–	6	4.3	–	M5	20	12	–	73.5	42	50	–	13	10	17	55°	28°

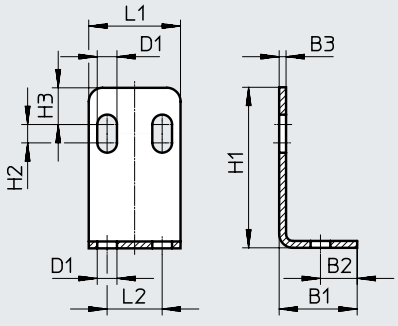
Swivel lever valve RW/O-3-PK-3



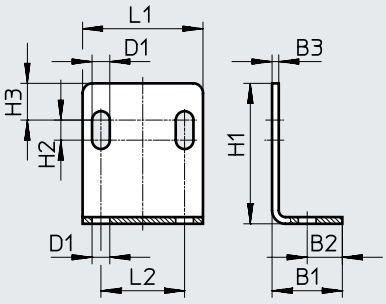
[1] Max. swivel angle W1
[2] Max. opening start W2
[3] Barbed connector for 3 mm I.D. plastic tubing

	B1	D1 f8	D2	D3	L1	L2	L3	L4	H1	H2	H3	H4	H5	H6	H7	W1 +24° – 14°	W2 +18° – 10	W2 +16° – 7
RW/O-3-PK-3	15	6	4.3	7	20	12	3	8.5	77	45.5	53	11	11	4	20	58°	36°	20°

Mounting bracket HV-M5



Mounting bracket HV-1/8

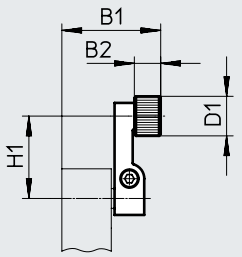


Mounting bracket	B1	B2	B3	D1 ø	L1	L2	H1	H2	H3
HV-M5	17	8	1.5	4.3	20	12	35	4	8
HV-1/8	21	10.5	2	5.3	36	25	42	6	11

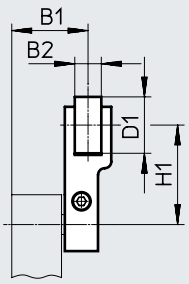
Datasheet

Actuator attachment for swivel lever valve

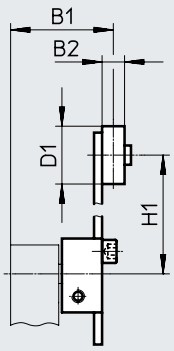
Swivel lever short ASK-01



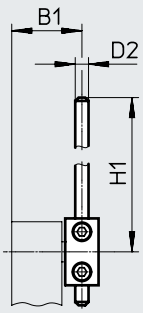
Swivel lever short ASK-02



Swivel lever long ASL-02



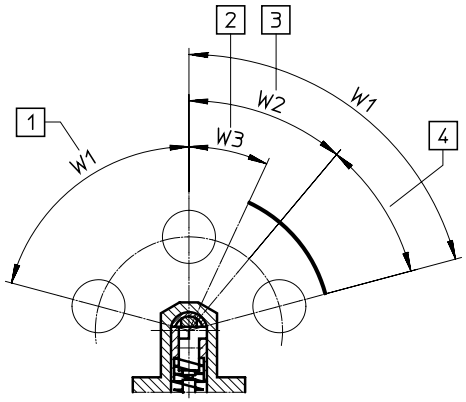
Swivel lever bar ASS-02



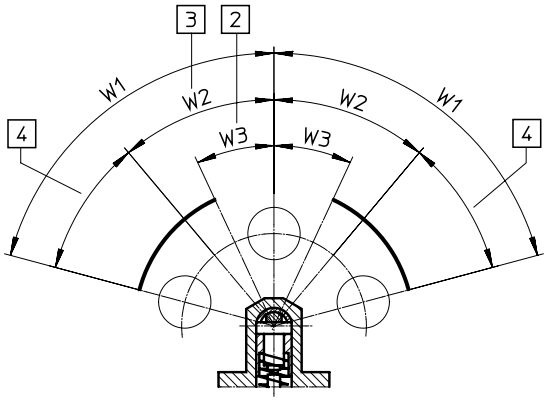
Actuator attachment	B1	B2	D1	D2	H1
ASK-01	30	8	12	–	25
ASK-02	23	8	17	–	30
ASL-02	32	7	18	–	25 ... 85
ASS-02	21	–	–	4	30 ... 140

Adjusting the actuation ranges by converting the control actuator

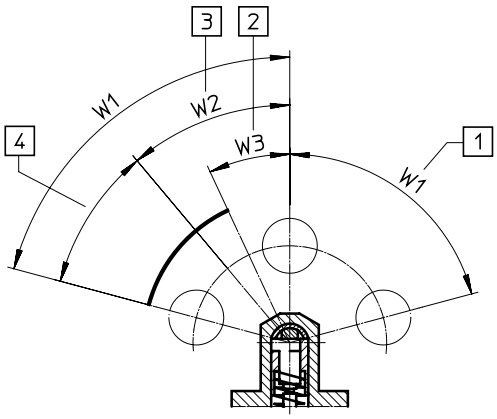
Basic setting (upon delivery)



Valve section 1 and 2 90° rotated around longitudinal axis



Valve section 1 and 2 180° rotated around longitudinal axis



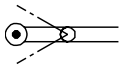
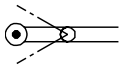
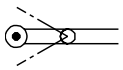
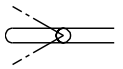
[1] (w1) idle, or max. angular setting (75°)
[2] (w3) opening start (25° ± 8°)
[3] (w2) max. opening angle (40° ± 5°)
[4] Follow-up time

Datasheet

Ordering data

Nominal flow rate [l/min]	Valve function	Description	Mechanical reset	Normal position	Part no.	Type
Swivel lever valve						
80	3/2-way valve, monostable	Suitable for vacuum	■	Closed	**4031**	**RW-3-M5**
80	3/2-way valve, monostable	Not suitable for vacuum	■	Open/closed	**10750**	**RW/O-3-PK-3**
140	3/2-way valve, monostable	Suitable for vacuum	■	Open/closed	**4937**	**RW/O-3-1/8**

Ordering data

	Description	Part no.	Type	PU[1]
Actuator attachment				
	Swivel lever short, version 1	**13248**	**ASK-01**	**1**
	Swivel lever short, version 2	**5835**	**ASK-02**	**1**
	Swivel lever, long	**5836**	**ASL-02**	**1**
	Swivel lever bar	**4789**	**ASS-02**	**1**

1) Packaging unit

Datasheet – Whisker valve, 146 ... 175 l/min standard nominal flow rate

- Flow rate
  146 ... 175 l/min

- Pressure
  0.35 ... 0.8 MPa
  3.5 ... 8 bar

- Temperature range
  –10 ... +60°C

Mounting via through-hole

General technical data			
Type		FVS-3-1/8	FVSO-3-1/8
Design		Whisker valve	
Standard nominal flow rate 1 → 2	[l/min]	146	175
Valve function		3/2-way valve, closed, monostable	3/2-way valve, open, monostable
Exhaust air		Can be throttled	
Design		Poppet seat valve, piloted	
Flow direction		Not reversible	
Sealing principle		Soft	
Mounting position		Any	
Information on forced switch on/off		Switching frequency min. 1/year	
Actuation type		Mechanical	
Reset method		Mechanical spring	
Pneumatic port		G1/8	
Nominal width	[mm]	3.5	
Weight	[g]	130	
Actuating force at 6 bar	[N]	→ graph	

Materials	
Seal	NBR
Housing	Anodised aluminium
Note on materials	RoHS-compliant

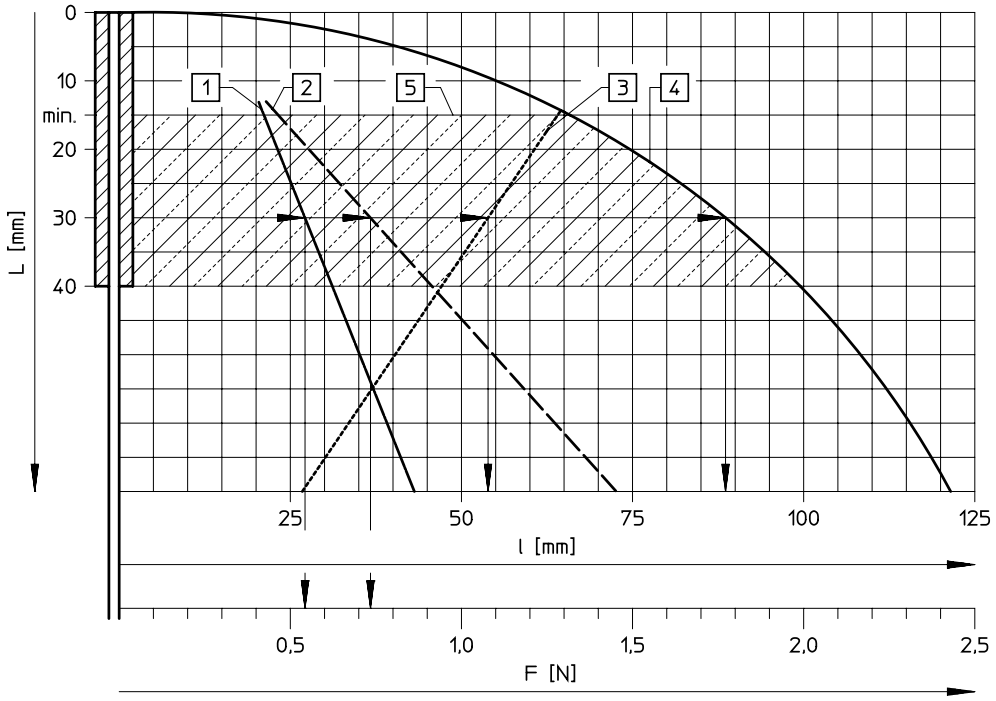
Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]
Pilot medium		Compressed air to ISO 8573-1:2010 [–:–:–]
Note on operating/ Pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure range	[MPa]	0.35 ... 0.8
	[bar]	3.5 ... 8
Temperature of medium	[°C]	–10 ... +60
Ambient temperature	[°C]	–10 ... +60
Corrosion resistance class CRC[1)]		2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Datasheet – Whisker valve, 146 ... 175 l/min standard nominal flow rate

Switching forces F and switching distances l at 6 bar as a function of approach distance L

Whisker valve



This pilot-operated valve with extremely low actuation forces is particularly suitable for systems with which uneven parts or actuating elements that are not precisely positioned are to be detected or in which the actuation levels are different. The whisker can be approached from any direction perpendicular to the whisker axis, or can be passed.

[1] Switching force
[2] Passing force
[3] Switching travel
[4] Overtravel
[5] Permissible approach range

Example:
A distance of 30 mm from the end of the spring results in

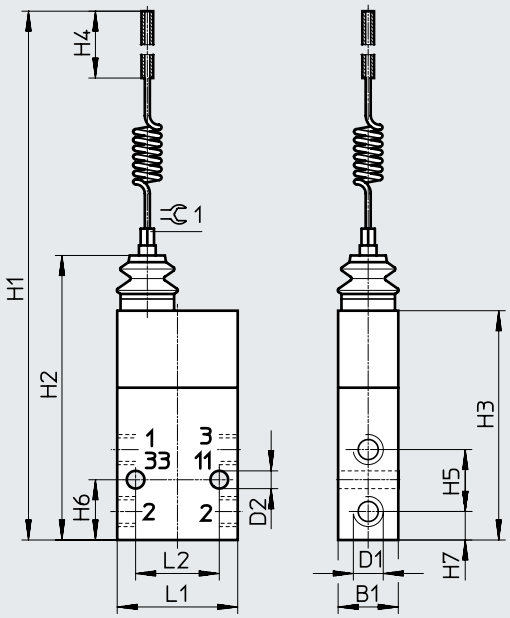
Switching travel 54 mm
Switching force 0.57 N

Overtravel 88 mm
Passing force 0.75 N

Datasheet – Whisker valve, 146 ... 175 l/min standard nominal flow rate

Dimensions Download CAD data ➔ www.festo.com

Whisker valve FVS, FVSO



Whisker valve	B1	D1	D2 ø	H1	H2	H3	H4 max.	H5	H6	H7	L1	L2	1
FVS-3-1/8, FVSO-3-1/8	18	G1/8	5.3	220	85	68.5	40	18.5	18	8.5	36	25	4

Ordering data

Nominal flow rate [l/min]	Valve function	Description	Normal position	Pilot air[1)]	Part no.	Type
Whisker valve						
146	3/2-way valve, monostable	Whisker valve	Closed	Internal	**3876**	**FVS-3-1/8**
175	3/2-way valve, monostable	Whisker valve	open	Internal	**3877**	**FVSO-3-1/8**

1) With pilot-operated valves

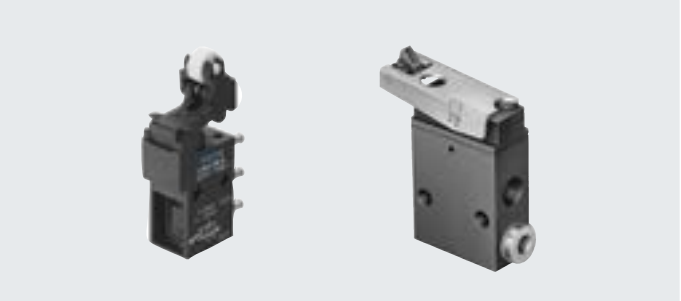
Data sheet – Roller lever valve, toggle lever valve, 80° ... 175 l/min standard nominal flow rate

- Flow rate
  80 ... 600 l/min

- Pressure
  –0.95 ... +8 bar

- Temperature range
  –10 ... +60°C

Mounting via through-hole



General technical data						
Type		L/O-3-PK-3	L-3-M5	LS-3-1/8	LOS-3-1/8	LS-4-1/8
Design		Toggle lever valve	Toggle lever valve	Toggle lever valve		
Standard nominal flow rate 1 → 2	[l/min]	80		146	175	128
Valve function		3/2-way valve		3/2-way valve	3/2-way valve	4/2-way valve
Design		Poppet valve, directly actuated		Poppet seat valve, piloted		
Flow direction		–	–	Not reversible		
Sealing principle		–	–	Soft		
Mounting position		–	–	Any		
Pneumatic port		PK-3[1]	M5	G1/8	G1/8	G1/8
Nominal width	[mm]	2.5	2	3.5	3.5	3.5
Weight	[g]	19	43	110	110	220
Actuating force • at 6 bar	[N]	–	16.5	1.7	1.8	2.2
• with normally closed position	[N]	10.0	–	–	–	–
• with normally open position	[N]	13.0	–	–	–	–

1) Barbed connector for plastic tubing, nominal width 3 mm

Materials				
Type	L/O-3-PK-3	L-3-M5	LS-3-1/8	LOS-3-1/8	LS-4-1/8
Seal	NBR				
Housing	POM	Die-cast zinc	Anodised aluminium		
Note on materials	–	–	RoHS-compliant		

Operating and environmental conditions						
Type		L/O-3-PK-3	L-3-M5	LS-3-1/8	LOS-3-1/8	LS-4-1/8
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]				
Note on operating/ Pilot medium		–	Lubricated operation possible (in which case lubricated operation will always be required)			
Operating pressure range	[MPa]	–	–	0.35 ... 0.8		
	[bar]	0 ... 8	–0.95 ... +8	3.5 ... 8		
Temperature of medium	[°C]	–	–	–10 ... +60		
Ambient temperature	[°C]	–10 ... +60				
Corrosion resistance class CRC[1]		–	–	2		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Data sheet – Roller lever valve, toggle lever valve, 550 ... 600 l/min standard nominal flow rate

General technical data				
Type		L-5-1/4-B	L-3-1/4-B	LO-3-1/4-B
Design		Toggle lever valve	Toggle lever valve	Toggle lever valve
Standard nominal flow rate 1 → 2	[l/min]	550	600	600
Valve function		5/2-way valve	3/2-way valve, closed	3/2 way valve, open
Design		Poppet valve, directly actuated	Poppet valve, directly actuated	Poppet valve, directly actuated
Pneumatic port		G1/4	G1/4	G1/4
Nominal width	[mm]	7.0	7.0	7.0
Weight	[g]	360	250	250
Actuating force	[N]	71.5	24.5	50.0

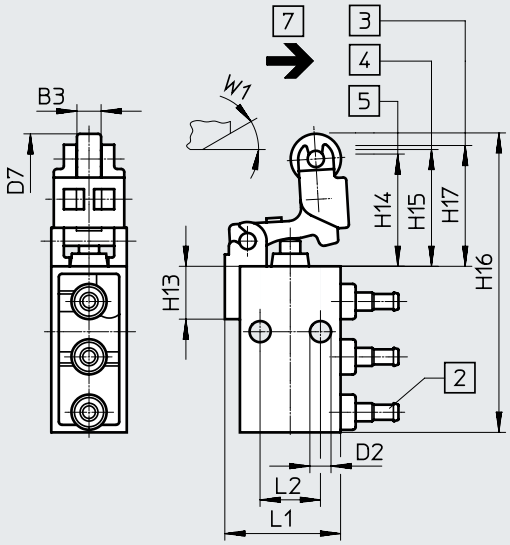
Materials			
Type	L-5-1/4-B	L-3-1/4-B	LO-3-1/4-B
Seal	NBR		
Housing	Die-cast aluminium		

Operating and environmental conditions				
Type		L-5-1/4-B	L-3-1/4-B	LO-3-1/4-B
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]		
Note on operating/ Pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure range	[bar]	–0.95 ... +10		
Ambient temperature	[°C]	–10 ... +60		

Datasheet

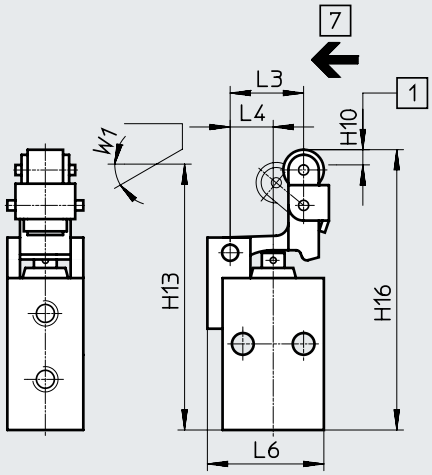
Dimensions Download CAD data ➔ www.festo.com

Roller lever valve L/O-3-PK-3



[2] Barbed connector for tubing I.D. 3 mm
[3] Opening start
[4] Max. opening
[5] Max. stroke
[7] Actuation direction

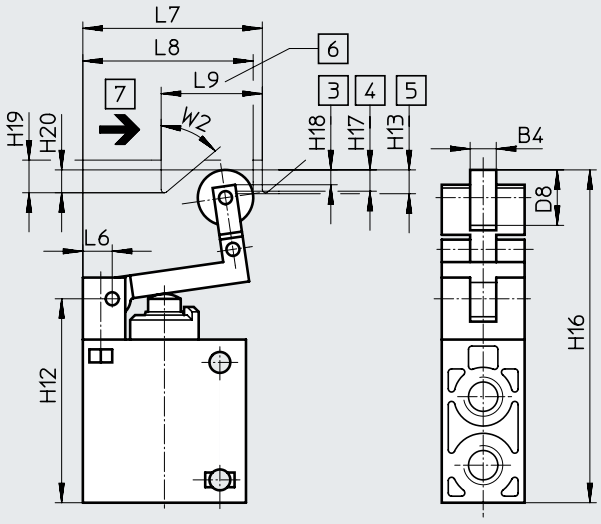
Roller lever valve L-3-M5



[1] Switching travel
[7] Actuation direction

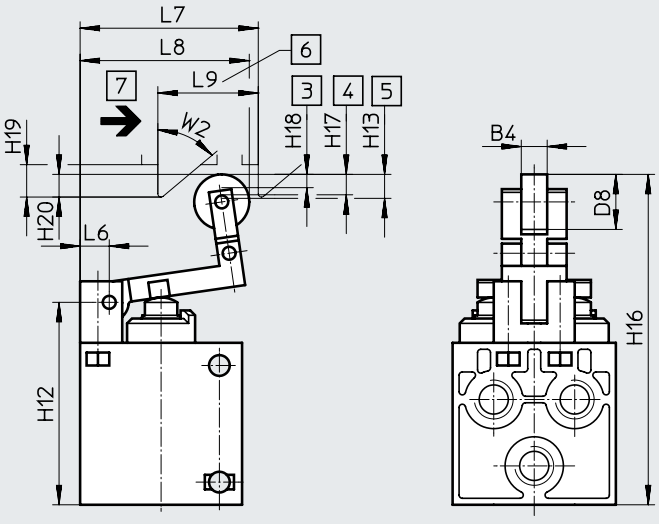
Toggle lever valve	B3 −0.1	D2 ø	D7 ø −0.1	L1	L2 +0.15	L3	L4	L6	H10	H13	H14	H15 +0.25 −0.75	H16	H17 +0.35 −0.7	W1
L/O-3-PK-3	4.8	4.3	10	23	12	–	–	23	–	10.5	22.3	23.2	59.5	24.8	30°
L-3-M5	–	–	–	–	–	14.5	8.5	23	3	52.5	–	–	55.5	–	30°

Roller lever valve L-3-1/4-B, LO-3-1/4-B



[3] Opening start
[4] Max. opening
[5] Max. stroke
[6] Cam actuating path
[7] Actuation direction

Roller lever valve L-5-1/4-B



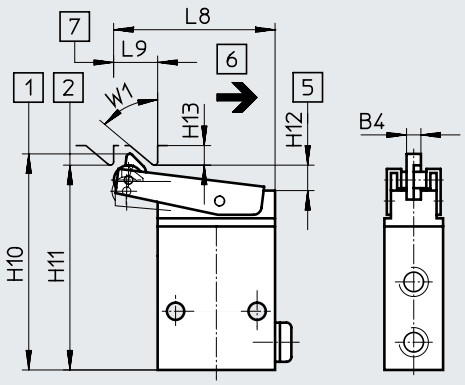
[3] Opening start
[4] Max. opening
[5] Max. stroke
[6] Cam actuating path
[7] Actuation direction

Toggle lever valve	B4	D8 ø	L6	L7	L8	L9	H12	H13	H16	H17	H18	H19	H20	W2
L-3-1/4-B, LO-3-1/4-B	8	17	9	55	54	31	62.5	7.4	102	6.3	4.1	10	7	50°
L-5-1/4-B	8	17	9	55	54	31	62.5	7.4	102	6.3	4.1	10	7	50°

Datasheet

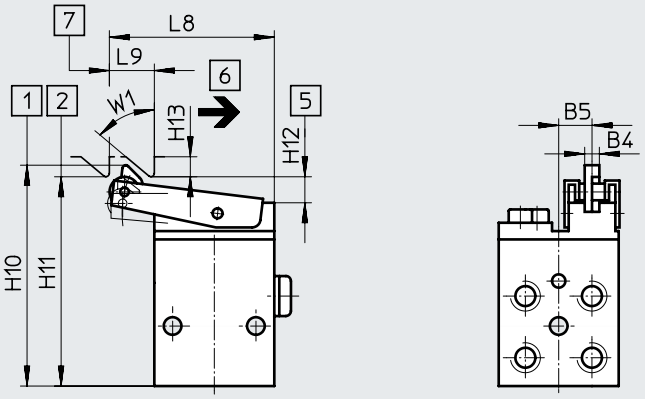
Dimensions Download CAD data ➔ www.festo.com

Toggle lever valve LS-3-1/8, LOS-3-1/8



[1] Initial position
[2] ON position
[5] Bottom edge of control rail or control cam
[6] Idle return
[7] Min. switching travel

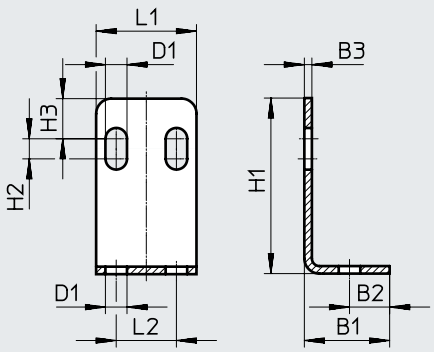
Toggle lever valve LS-4-1/8



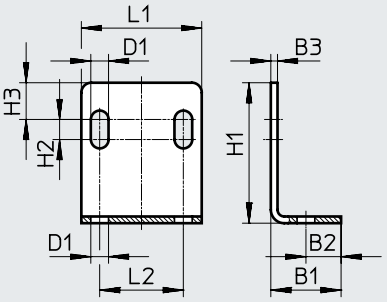
[1] Initial position
[2] ON position
[5] Bottom edge of control rail or control cam
[6] Idle return
[7] Min. switching travel

Toggle lever valve	B4	B5	L8	L9	H10	H11	H12 +0.2 −0.3	H13	W1
LS-3-1/8, LOS-3-1/8	4	–	49.5	13.5	66	62.5	7.5	6	50°
LS-4-1/8	4.4	9	49.5	13.5	66	62.5	7.5	6	50°

Mounting bracket HV-M5



Mounting bracket HV-1/8



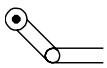
Mounting bracket	B1	B2	B3	D1 ø	L1	L2	H1	H2	H3
HV-M5	17	8	1.5	4.3	20	12	35	4	8
HV-1/8	21	10.5	2	5.3	36	25	42	6	11

Ordering data

Ordering data

Nominal flow rate [l/min]	Valve function	Description	Mechanical reset	Normal position	Part no.	Type
Toggle lever valve						
128	4/2-way valve, monostable	Toggle lever valve	■	–	**3416**	**LS-4-1/8**
146	3/2-way valve, monostable	Toggle lever valve	■	Closed	**2186**	**LS-3-1/8**
175	3/2-way valve, monostable	Toggle lever valve	■	Open	**2950**	**LOS-3-1/8**
Toggle lever valve						
80	3/2-way valve, monostable	Toggle lever valve	■	Open/closed	**10749**	**L/O-3-PK-3**
		Toggle lever valve, suitable for vacuum		Closed	**3628**	**L-3-M5**
550	5/2-way valve, monostable	Toggle lever valve, suitable for vacuum	■	–	**8993**	**L-5-1/4-B**
600	3/2-way valve, monostable	Toggle lever valve, suitable for vacuum	■	Closed	**8982**	**L-3-1/4-B**
				Open	**8989**	**LO-3-1/4-B**

Ordering data

	Description	Part no.	Type	PU[1]
Actuator attachment				
	For roller lever valve L-3-M5, roller lever with idle return with retaining screws	**6513**	**AL-05**	**1**

1) Packaging unit

Datasheet – Roller lever valve, roller actuated valve, 80 ... 170 l/min standard nominal flow rate

- Flow rate
  80 ... 600 l/min

- Pressure
  –0.95 ... +10 bar

- Temperature range
  –10 ... +60°C

Mounting either via through-hole or on front panel

General technical data						
Type		R/O-3-PK-3	R-3-M5	RS-3-1/8	ROS-3-1/8	RS-4-1/8
Design		Roller lever valve				
Standard nominal flow rate 1 ⇢ 2	[l/min]	80		151	169	128
Valve function		3/2-way valve, open/ closed	3/2-way valve	3/2-way valve	3/2-way valve	4/2-way valve
Exhaust air		–	–	Can be throttled		
Design		Poppet valve, directly actuated		Poppet seat valve, piloted		
Flow direction		–	–	Not reversible		
Sealing principle		–	–	Soft		
Mounting position		–	–	Any		
Note on forced checking procedure		–		Switching frequency min. 1/year		
Pneumatic port		PK-3[1)]	M5	G1/8	G1/8	G1/8
Nominal width	[mm]	2.5	2	3.5	3.5	3.5
Weight	[g]	18	40	120	120	230
Actuating force • at 6 bar	[N]	–	16.5	1.7	1.9	1.8
• with normally closed position	[N]	10.0	–	–	–	–
• with normally open position	[N]	15.0	–	–	–	–

1) Barbed connector for plastic tubing, nominal width 3 mm

Datasheet – Roller lever valve, roller actuated valve, 80 ... 170 l/min standard nominal flow rate

Materials						
Type		R/O-3-PK-3	R-3-M5	RS-3-1/8	ROS-3-1/8	RS-4-1/8
Seal		NBR				
Housing		POM	Die-cast zinc	Anodised aluminium		
Note on materials		–	–	RoHS-compliant		

Operating and environmental conditions						
Type		R/O-3-PK-3	R-3-M5	RS-3-1/8	ROS-3-1/8	RS-4-1/8
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]				
Note on the operating/ pilot medium		Compressed air to ISO 8573-1:2010 [–:–:–] Lubricated operation possible (in which case lubricated operation will always be required)				
Operating pressure range	[MPa]	–	–	0.35 ... 0.8	0.35 ... 0.8	0.35 ... 0.8
	[bar]	0 ... 8	–0.95 ... +8	3.5 ... 8	3.5 ... 8	3.5 ... 8
Temperature of medium	[°C]	–	–	–10 ... +60		
Ambient temperature	[°C]	–10 ... +60				
Corrosion resistance class CRC[1)]		–	–	2		

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Technical data – actuator attachment			
Type		AR-01	AL-01
Design		Roller lever	Roller lever with idle return
Max. actuating force	[N]	10	12
Weight	[g]	42	52

Materials - Actuator attachment	
Actuator attachment	Galvanised steel

Datasheet – Roller lever valve, roller actuated valve, 550 ... 600 l/min standard nominal flow rate

General technical data				
Type		R-5-1/4-B	R-3-1/4-B	RO-3-1/4-B
Design		Roller lever valve	Roller lever valve	Roller lever valve
Standard nominal flow rate 1 ⇢ 2	[l/min]	550	600	600
Valve function		5/2-way valve	3/2-way valve, closed	3/2 way valve, open
Design		Poppet valve, directly actuated	Poppet valve, directly actuated	Poppet valve, directly actuated
Pneumatic port		G1/4	G1/4	G1/4
Nominal width	[mm]	7.0	7.0	7.0
Weight	[g]	340	230	230
Actuating force	[N]	75.0	26.0	48.0

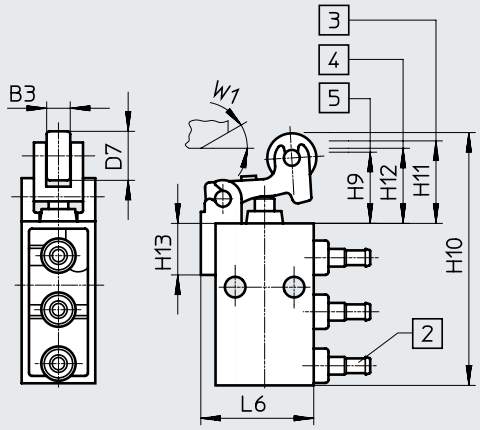
Materials	
Seal	NBR
Housing	Die-cast aluminium

Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [–:–:–]
Note on operating/ Pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure range	[bar]	–0.95 ... +10
Ambient temperature	[°C]	–10 ... +60

Datasheet

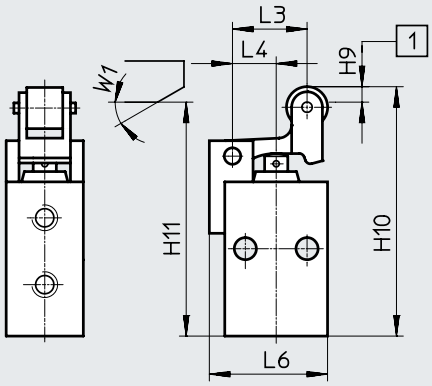
Dimensions Download CAD data ➔ www.festo.com

Roller lever valve R/O-3-PK-3R



[2] Barbed connector for tubing I.D. 3 mm
[3] Opening start
[4] Max. opening
[5] Max. stroke

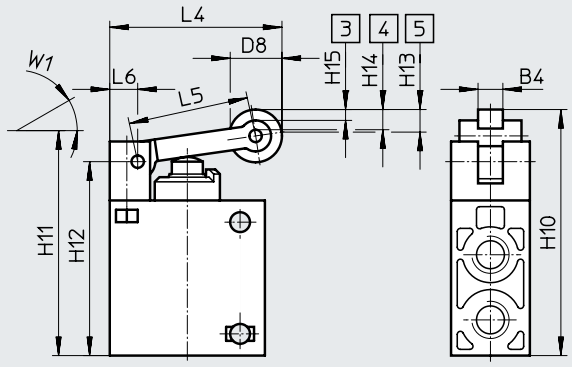
Roller lever valve R-3-M5



[1] Switching travel

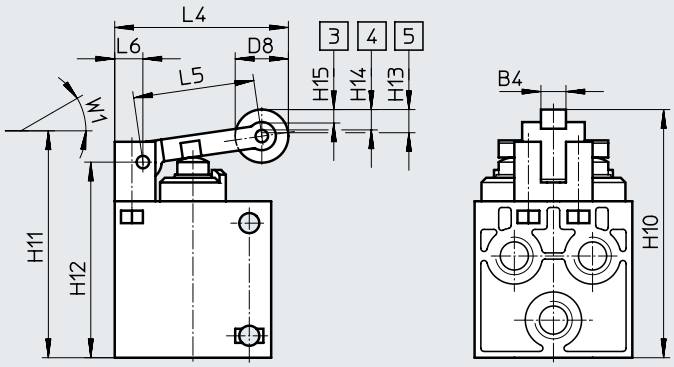
Roller lever valve	B3	D7 ø	L3	L4	L6	H9	H10	H11	H12	H13	W1
R/O-3-PK-3	4.8	10	–	–	23	14.5	51.5	16.8	15.3	10.5	30°
R-3-M5	–	–	14.5	8.5	23	3	48.5	45.5	–	–	30°

Roller lever valve R-3-1/4-B, RO-3-1/4-B



[3] Opening start
[4] Max. opening
[5] Max. stroke

Roller lever valve R-5-1/4-B



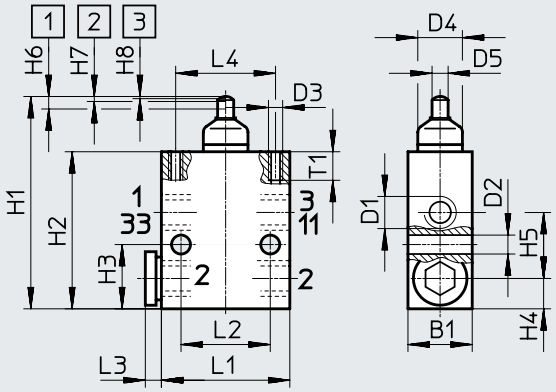
[3] Opening start
[4] Max. opening
[5] Max. stroke

Roller lever valve	B4	D8 ø	L4	L5	L6	H10	H11 min	H12	H13	H14	H15	W1
R-3-1/4-B, RO-3-1/4-B	8	17	55.5	39	9	79.3	72.5	62.5	7.4	6.5	4.3	30°
R-5-1/4-B	8	17	55.5	39	9	79.3	72.5	62.5	7.4	6.5	4.3	30°

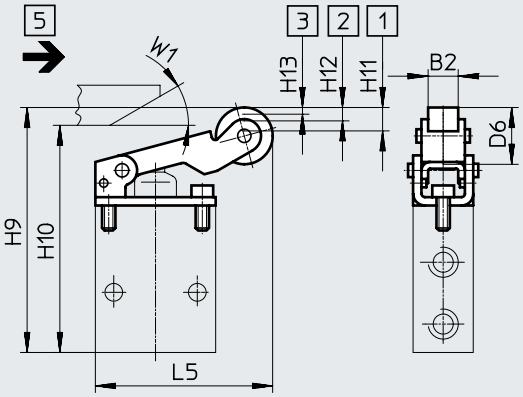
Datasheet

Dimensions Download CAD data ➔ www.festo.com

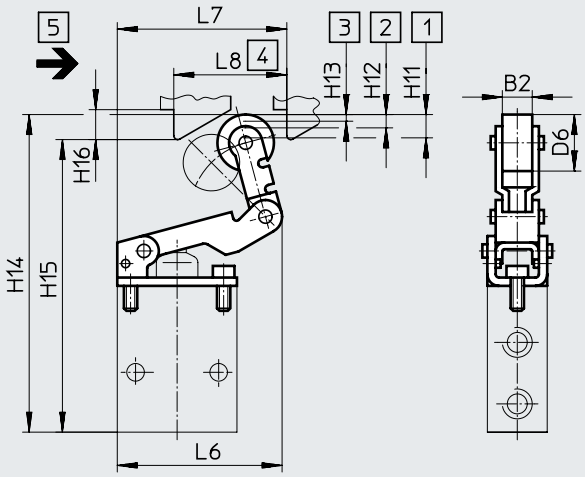
Basic valve, stem actuated valve V/O-3-1/8



Actuator attachment roller lever AR-01 for stem actuated valve V/O-3-1/8



Actuator attachment roller lever with idle return AL-01 for stem actuated valve V/O-3-1/8



[1] Max. stroke
[2] Max. opening
[3] Opening start
[4] Min. actuation stroke
[5] Actuation direction

Stem actuated valve	B1	D1	D2	D3	D4	D5	L1	L2	L3	L4	H1	H2	H3	H4	H5	H6	H7 ±0.2	H8 ±0.2	T1
V/O-3-1/8	18	G1/8	5.3	M4	12.5	4.5	36	25	4.5	28	59.5	44	18	8.5	18.5	3.5	1.4	0.6	8

Actuator attachment	B2	D6	L5	L6	L7	L8	H9	H10 Min.	H11	H12 +0.2	H13 +0.2	H14	H15 Min.	H16	W1
AR-01	8	17	54	–	–	–	71	64	7	4	2	–	–	–	30°
AL-01	8	17	–	50.5	51	34	–	–	7	4	2	93.5	86.5	9	–

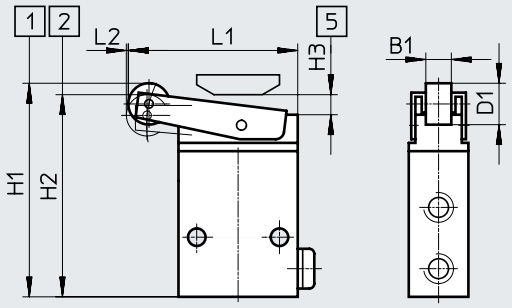
Note

The stem actuated valve V/O-3-1/8 can be converted to a roller lever valve or a toggle roller lever valve with an actuator attachment.
The technical data are listed with the stem actuated valve.

Datasheet

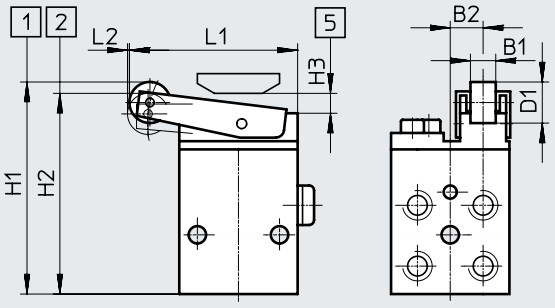
Dimensions Download CAD data ➔ www.festo.com

Roller lever valve RS-3-1/8, ROS-3-1/8



[1] Initial position
[2] ON position
[5] Bottom edge of control rail or control cam

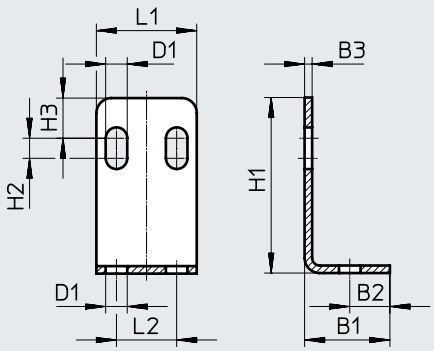
Roller lever valve RS-4-1/8



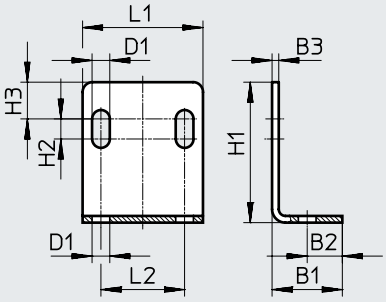
[1] Initial position
[2] ON position
[5] Bottom edge of control rail or control cam

Roller lever valve	B1 −0.1	B2	D1 ø ±0.08	L1 ±0.4	L2 ±0.3	H1 +1.5 −1.1	H2	H3 +0.2 −0.3
RS-3-1/8, ROS-3-1/8	7.9	–	12.5	51.2	0.6	64.6	61	6
RS-4-1/8	7.9	9	12.5	51.2	0.6	64.6	61	6

Mounting bracket HV-M5



Mounting bracket HV-1/8



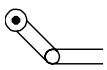
Mounting bracket	B1	B2	B3	D1 ø	L1	L2	H1	H2	H3
HV-M5	17	8	1.5	4.3	20	12	35	4	8
HV-1/8	21	10.5	2	5.3	36	25	42	6	11

Ordering data

Ordering data

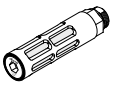
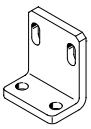
Nominal flow rate [l/min]	Valve function	Description	Mechanical reset	Normal position	Part no.	Type
Roller lever valve						
80	3/2-way valve, monostable	Roller lever valve	■	Open/closed	**10748**	**R/O-3-PK-3**
				Closed	**3629**	**R-3-M5**
128	4/2-way valve, monostable	Roller lever valve	■	–	**2949**	**RS-4-1/8**
151	3/2-way valve, monostable	Roller lever valve	■	Closed	**2272**	**RS-3-1/8**
169	3/2-way valve, monostable	Roller lever valve	■	Open	**2270**	**ROS-3-1/8**
550	5/2-way valve, monostable	Roller lever valve, suitable for vacuum	■	–	**8996**	**R-5-1/4-B**
600	3/2-way valve, monostable	Roller lever valve, suitable for vacuum	■	Closed	**8985**	**R-3-1/4-B**
				Open	**8991**	**RO-3-1/4-B**

Ordering data

	Description	Part no.	Type	PU[1]
Actuator attachment				
	For stem actuated valve V/O-3-1/8, roller lever	**4936**	**AR-01**	**1**
	For stem actuated valve V/O-3-1/8, roller lever with idle return	**4941**	**AL-01**	**1**
	For roller lever valve R-3-M5, roller lever with retaining screws	**6512**	**AR-05**	**1**

1) Packaging unit

Accessories

Ordering data					
	Description		Part no.	Type	PU[1]
Push-in fitting with external hex (mini version)					
	Connecting thread M5 for tubing O.D.	3 mm	**153302**	**QSM-M5-3**	**10**
		4 mm	**153304**	**QSM-M5-4**	**10**
		6 mm	**153306**	**QSM-M5-6**	**10**
	Connecting thread G1/8 for tubing O.D.	4 mm	**186264**	**QSM-G1/8-4**	**10**
		6 mm	**186265**	**QSM-G1/8-6**	**10**
Push-in fitting with external hex (standard version)					
	Connecting thread G1/8 for tubing O.D.	4 mm	**186095**	**QS-G1/8-4**	**10**
		6 mm	**186096**	**QS-G1/8-6**	**10**
	Connecting thread G1/4 for tubing O.D.	6 mm	**186097**	**QS-G1/4-6**	**10**
		8 mm	**186099**	**QS-G1/4-8**	**10**
		10 mm	**186101**	**QS-G1/4-10**	**10**
Push-in fitting with internal hex (mini version)					
	Connecting thread M5 for tubing O.D.	3 mm	**153313**	**QSM-M5-3-I**	**10**
		4 mm	**153315**	**QSM-M5-4-I**	**10**
		6 mm	**153315**	**QSM-M5-6-I**	**10**
	Connecting thread G1/8 for tubing O.D.	4 mm	**186266**	**QSM-G1/8-4-I**	**10**
		6 mm	**186267**	**QSM-G1/8-6-I**	**10**
Push-in fitting with internal hex (standard version)					
	Connecting thread G1/8 for tubing O.D.	4 mm	**186106**	**QS-G1/8-4-I**	**10**
		6 mm	**186107**	**QS-G1/8-6-I**	**10**
		8 mm	**186109**	**QS-G1/8-8-I**	**10**
	Connecting thread G1/4 for tubing O.D.	6 mm	**186108**	**QS-G1/4-6-I**	**10**
		8 mm	**186110**	**QS-G1/4-8-I**	**10**
		10 mm	**186112**	**QS-G1/4-10-I**	**10**
Silencers					
	Connecting thread	G1/8	**2307**	**U-1/8**	**1**
			161419	**UC-1/8**	**1**
		G1/4	**2316**	**U-1/4**	**1**
			6842	**U-1/4-B**	**1**
			165004	**UC-1/4**	**1**
Mounting bracket					
	for valves with push-in connector and M5 threaded connection	11 g	**9634**	**HV-M5**	**1**
	for valves with push-in connector and G1/8 threaded connection	32 g	**9635**	**HV-1/8**	**1**

1) Packaging unit