

## 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
  - Roller lever valve with idle return
  - Whisker valve
  - Roller actuated valve

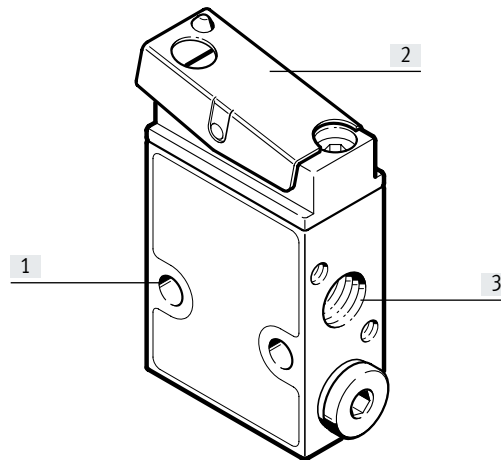
**Operational safety**

- 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 thread-  
ed 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](http://www.festo.com)

You can order mechanically and manu-  
ally 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

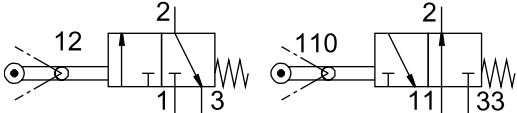
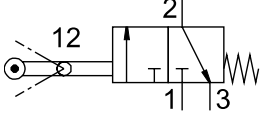
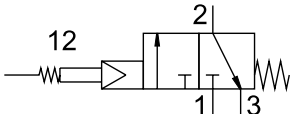
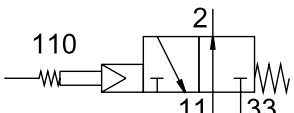
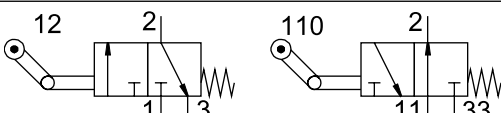
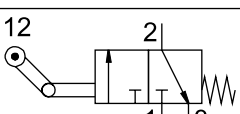
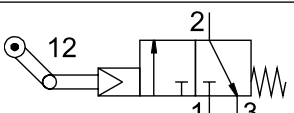
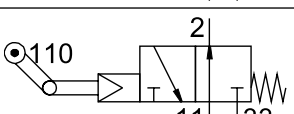
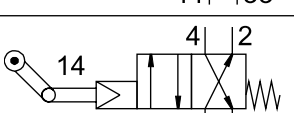
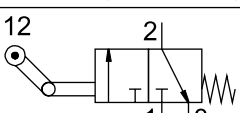
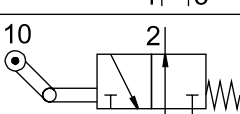
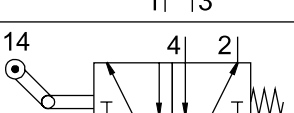
and in conveyor systems, e.g. to control simple clamping and locking processes in semi-automatic assembly and manufacturing. A modern design with a metal housing combines durability and functionality.

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
<b>Stem actuated valve</b>		
	V-3-M5 V-3-1/4-B V/O-3-PK-3	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum (not V/O-3-PK-3)</li> </ul>
	VO-3-1/4-B	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
	V/O-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open/closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
	VS-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Pneumatically piloted, internal pilot air</li> <li>• Mechanical spring return</li> </ul>
	VOS-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Pneumatically piloted, internal pilot air</li> <li>• Mechanical spring return</li> </ul>
	VS-4-1/8	4/2-way valve, monostable <ul style="list-style-type: none"> <li>• Pneumatically piloted, internal pilot air</li> <li>• Mechanical spring return</li> </ul>
	V-5-1/4-B	5/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open/closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>

## Key features – Pneumatic components

Valve functions Circuit symbol	Type	Description
<b>Swivel lever valve</b>		
	RW/O-3-1/8 RW/O-3-1/8-S9 RW/O-3-PK-3	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open/closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum (only RW/O-3-1/8)</li> </ul>
	RW-3-M5	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
<b>Whisker valve</b>		
	FVS-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
	FVS0-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
<b>Toggle lever valve</b>		
	L/O-3-PK-3	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open/closed</li> <li>• Mechanical spring return</li> </ul>
	L-3-1/4-B	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
<b>Toggle lever valve</b>		
	LS-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
	LOS-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
	LS-4-1/8	4/2-way valve, monostable <ul style="list-style-type: none"> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
<b>Roller lever valve with idle return</b>		
	L-3-M5	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
	LO-3-1/4-B	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
	L-5-1/4-B	5/2-way valve, monostable <ul style="list-style-type: none"> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>




Key features – Pneumatic components

Valve functions – circuit symbol		
Circuit symbol	Type	Description
<b>Roller lever, roller actuated valve</b>		
	R-3-M5 R-3-1/4-B	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
	RO-3-1/4-B	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>
	R/O-3-PK-3	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open/closed</li> <li>• Mechanical spring return</li> </ul>
	RS-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
	ROS-3-1/8	3/2-way valve, monostable <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
	RS-4-1/8	4/2-way valve, monostable <ul style="list-style-type: none"> <li>• Mechanical spring return</li> <li>• Pneumatically piloted, internal pilot air</li> </ul>
	R-5-1/4-B	5/2-way valve, monostable <ul style="list-style-type: none"> <li>• Mechanical spring return</li> <li>• Suitable for vacuum</li> </ul>

-  - **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 [l/min] 1 → 2	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 <sup>1)</sup>	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 [N]	23.0	17.0	3.0	3.2	28.0	28.0
• at 6 bar						
• 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 <sup>1)</sup>	–	–	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
Weight	[g]	30	30

Materials - Swivel lever	
Swivel lever	Aluminium, steel



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

General technical data		V-5-1/4-B	VO-3-1/4-B	V-3-1/4-B
Type		V-5-1/4-B	VO-3-1/4-B	V-3-1/4-B
Standard nominal flow rate	[l/min]	550	600	
1 → 2				
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

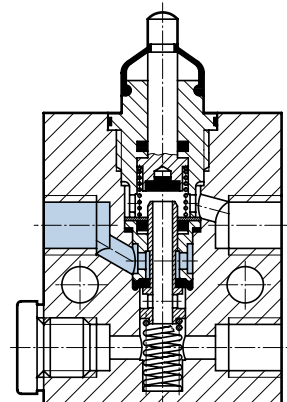
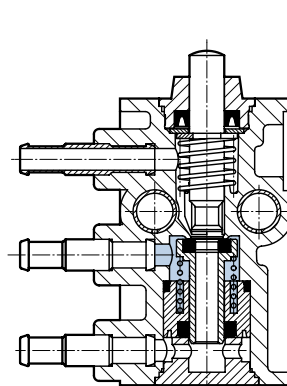
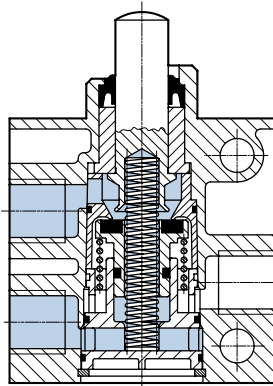
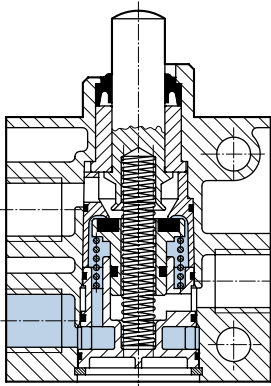
### Sectional view

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

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

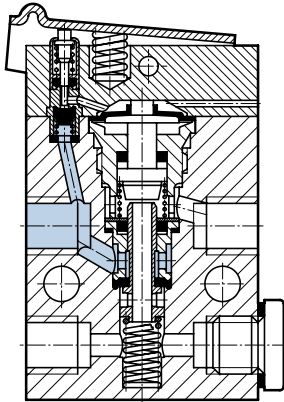
V/O-3-PK-3

V/O-3-1/8

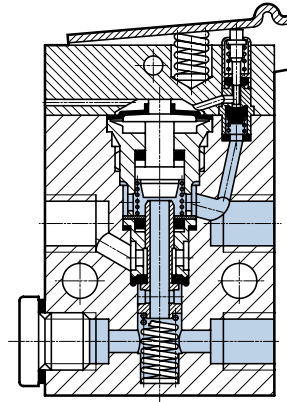
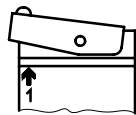


V ... -3-1/8, normally closed

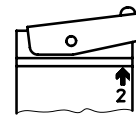
V ... -3-1/8, normally open



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

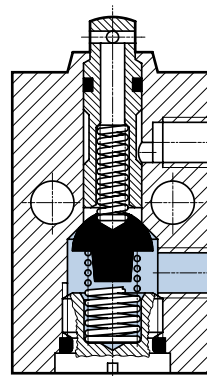
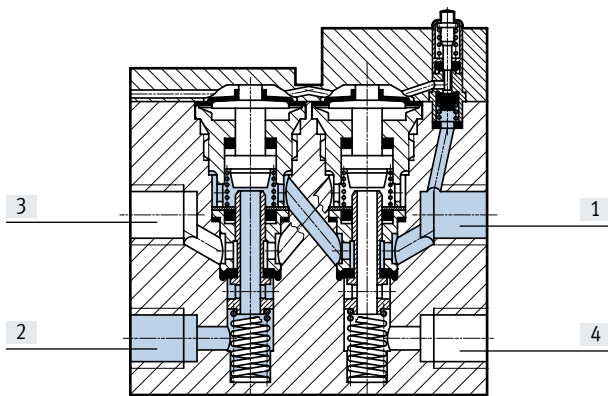


Actuator attachment on the right  
(number 1 on the attachment above  
number 2 on the housing)




VS-4-1/8

V-3-M5



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

[3] Exhaust port

 **Note**

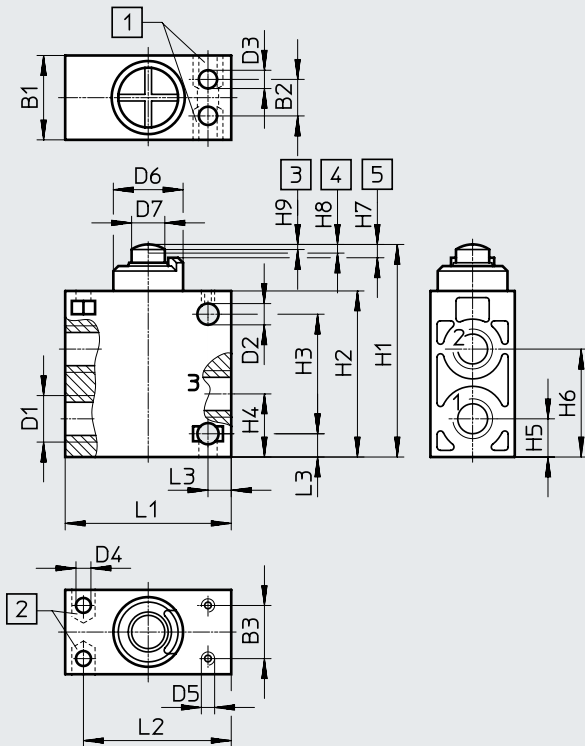
The sectional views, shown on the stem actuated valve, are also generally applicable for roller lever valves, toggle lever valves and swivel lever valves. The function remains identical, only the operation with actuator attachments is different.

Datasheet

Dimensions

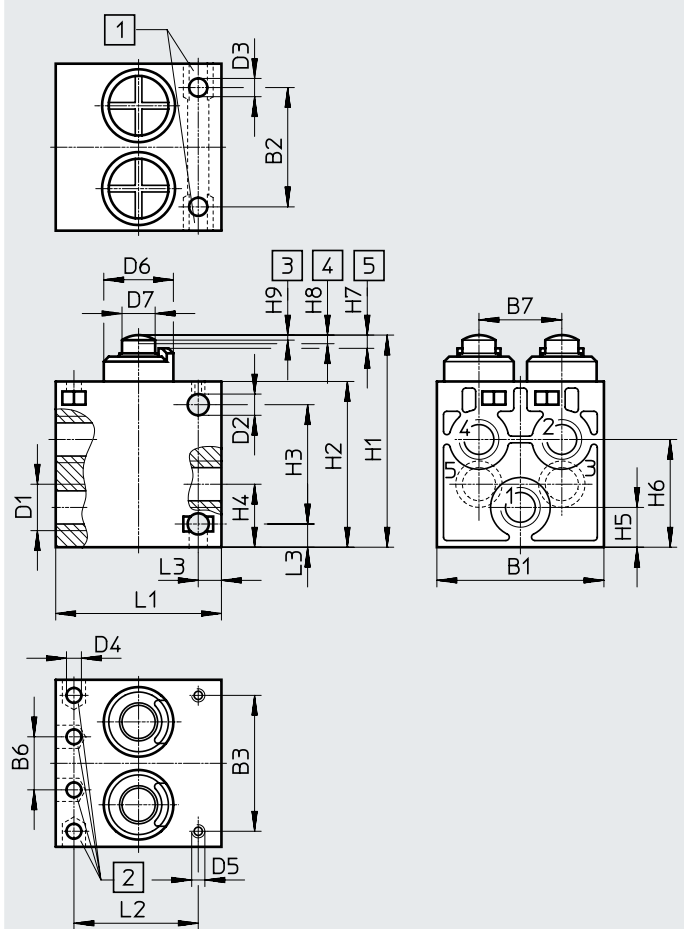
Download CAD data → [www.festo.com](http://www.festo.com)

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 ∅	D3 ∅	D4 ∅	D5	D6 ∅	D7 ∅
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

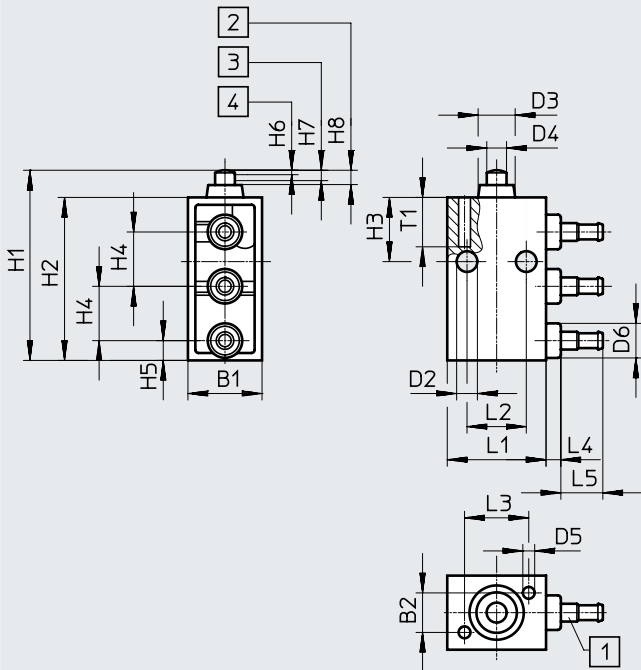
Stem actuated valve	L1	L2	L3	H1	H2	H3	H4	H5	H6	H7	H8	H9
V-3-1/4-B, VO-3-1/4-B	50	44.5	7	64	50	36	19	11.5	32.5	4	2.6	1.7
V-5-1/4-B	50	37.5	7	64	50	36	19	11.5	32.5	4	2.6	1.7

Datasheet

Dimensions

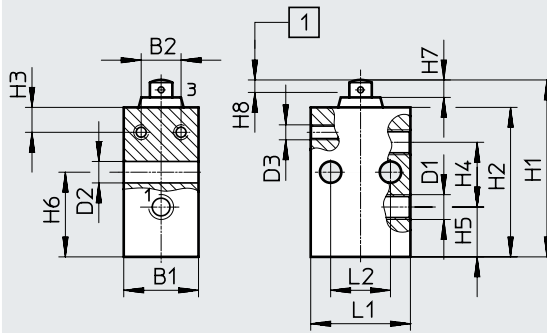
Download CAD data → [www.festo.com](http://www.festo.com)

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	D3	D3	D4	D5	D6	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	-	-	-	-

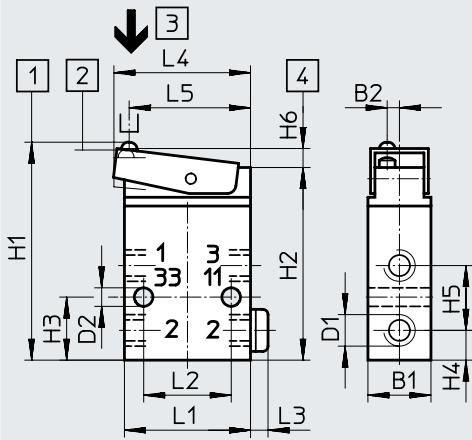
Stem actuated valve	L1	L2	L3	L4	L5	H1	H2	H3	H4	H5	H6	H7	H8
V/O-3-PK-3	20	12	13	3	8.5	38.5	33	13	11	4	0.9	2.1	2.9
V-3-M5	-	-	-	-	-	35.5	30	8	13	10	17	3.5	2.5

Datasheet

Dimensions

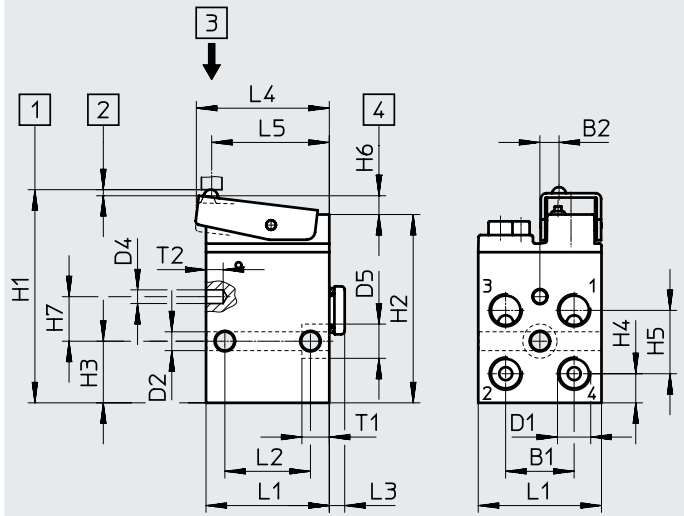
Download CAD data → [www.festo.com](http://www.festo.com)

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 ∅	D4 ∅	D5 ∅	T1	T2
VS-3-1/8	18	3.5	G1/8	5.5	-	-	-	-
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

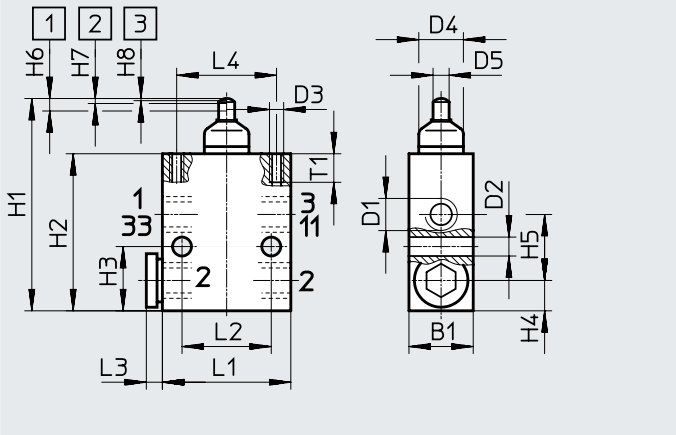
Stem actuated valve	L1	L2	L3	L4	L5	H1	H2	H3	H4	H5	H6	H7
VS-3-1/8	36	25	4.5	39	38.5	62.5	55	18	8.5	18.5	5.5	-
VOS-3-1/8	36	25	4.5	39	38.5	62.5	55	18	8.5	18.5	5.5	-
VS-4-1/8	36	25	4.5	39	35.5	62.5	55	18	8.5	18.5	5.5	13

Datasheet

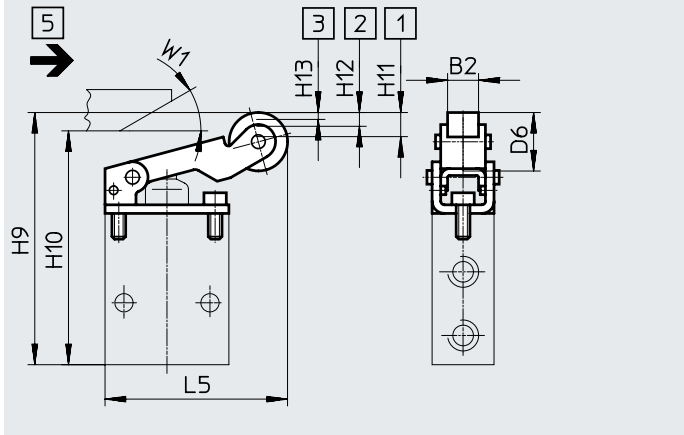
Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

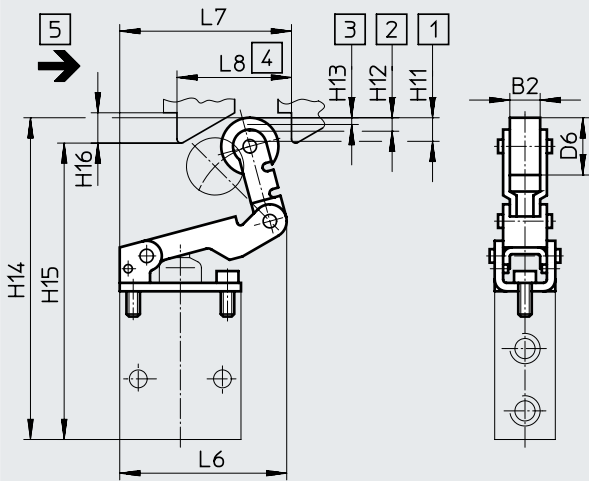
Stem actuated valve V/O-3-1/8



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 ∅	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

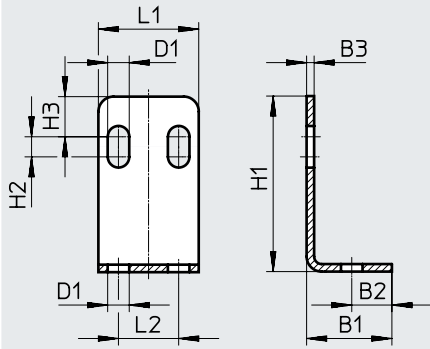
Actuator attachment	B2	D6 ∅	L5	L6	L7	L8	H9	H10 Min.	H11	H12 +0.2	H13 +0.2	H14	H15 Min.	H16	W1
AR-01	8	17	54	-	-	-	71	64	7	4	2	-	-	-	30°
AL-01	8	17	-	50.5	51	34	-	-	7	4	2	93.5	86.5	9	-

Datasheet

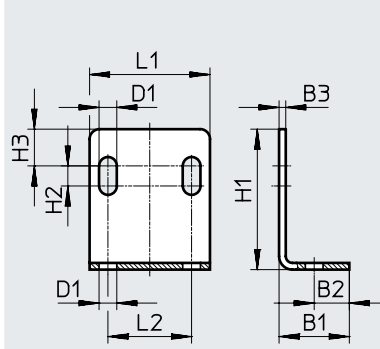
Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Mounting bracket HV-M5



Mounting bracket HV-1/8






Mounting bracket	B1	B2	B3	D1 ∅	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
<b>Stem actuated valve</b>						
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	[l/min]	80	80	140
1 → 2				
Valve function		3/2-way valve		
Design		Poppet valve, directly actuated		
Pneumatic port		M5	NW3 (barbed connector)	G $\frac{1}{8}$
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

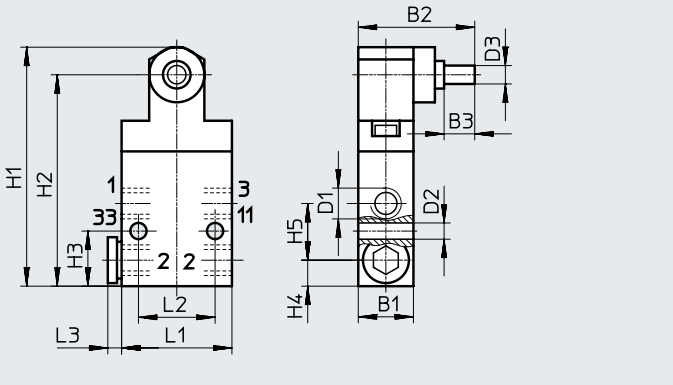
Materials - Swivel lever					
Swivel lever, type		ASK-01 (short)	ASK-02 (short)	ASL-02 (long)	ASS-02 (bar)
Material		Die-cast zinc	Aluminium, steel		



Datasheet

Dimensions

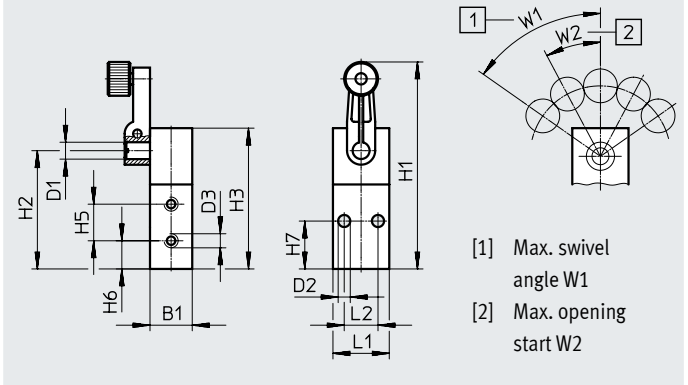
Swivel lever valve RW/O-3-1/8



	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°

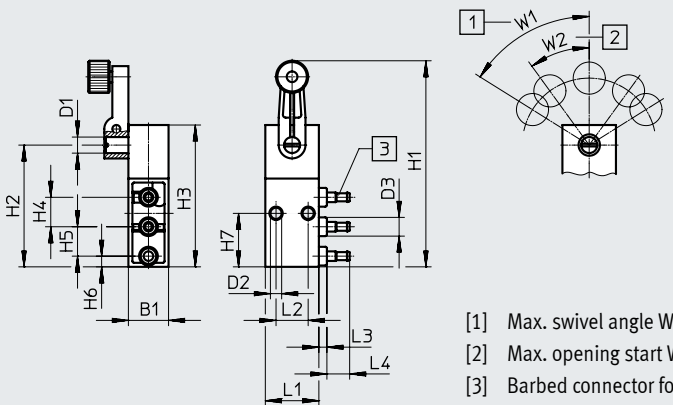
Download CAD data → [www.festo.com](http://www.festo.com)

Swivel lever valve RW-3-M5



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

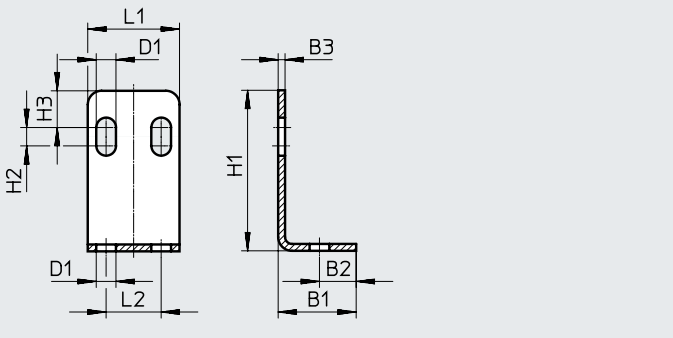
Swivel lever valve RW/O-3-PK-3



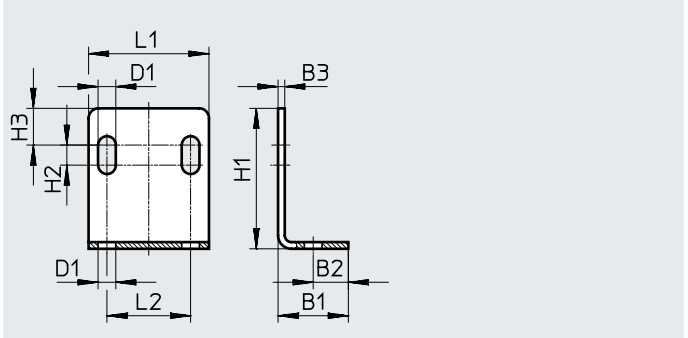
- [1] Max. swivel angle W1
- [2] Max. opening start W2
- [3] Barbed connector for 3 mm I.D. plastic tubing

	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

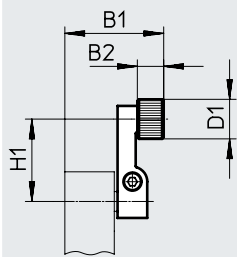


Mounting bracket	B1	B2	B3	D1 ø	L1	L2	H1	H2	H3
HV-M5	17	8	1.5	4.3	20	12	35	4	8
HV-1/8	21	10.5	2	5.3	36	25	42	6	11

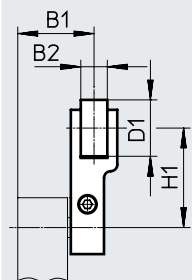
Datasheet

Actuator attachment for swivel lever valve

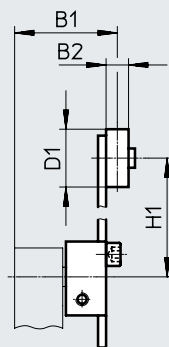
Swivel lever short ASK-01



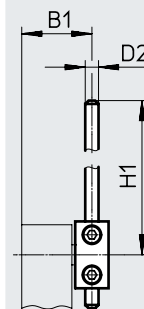
Swivel lever short ASK-02



Swivel lever long ASL-02



Swivel lever bar ASS-02

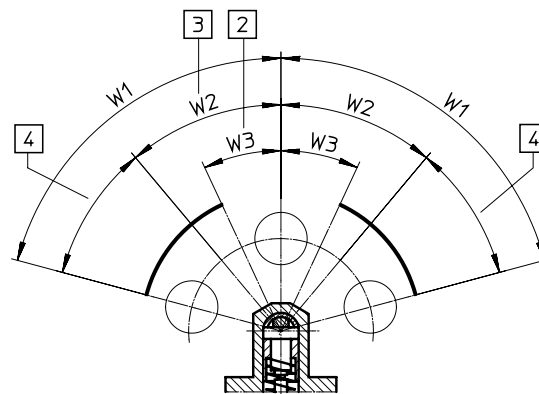
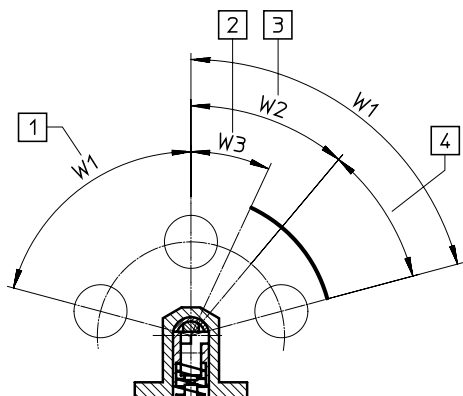


Actuator attachment	B1	B2	D1	D2	H1
ASK-01	30	8	12	-	25
ASK-02	23	8	17	-	30
ASL-02	32	7	18	-	25 ... 85
ASS-02	21	-	-	4	30 ... 140

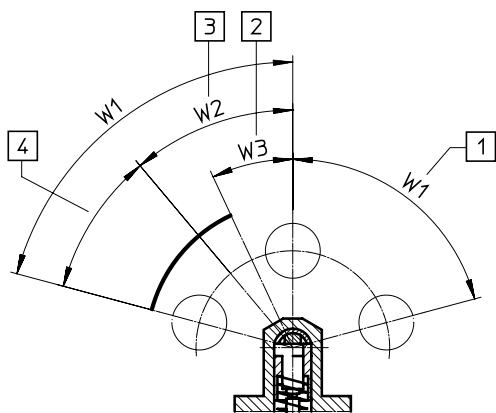
Adjusting the actuation ranges by converting the control actuator

Basic setting (upon delivery)

Valve section 1 and 2 90° rotated around longitudinal axis



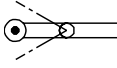
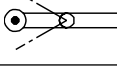
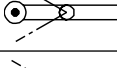
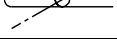
Valve section 1 and 2 180° rotated around longitudinal axis



- [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
<b>Swivel lever valve</b>						
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 <sup>1)</sup>
<b>Actuator attachment</b>				
	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

Mounting via through-hole

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

-  - Temperature range  
-10 ... +60°C



General technical data		FVS-3-1/8	FVSO-3-1/8
Type		Whisker valve	
Design		Whisker valve	
Standard nominal flow rate	[l/min]	146	175
1 → 2			
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

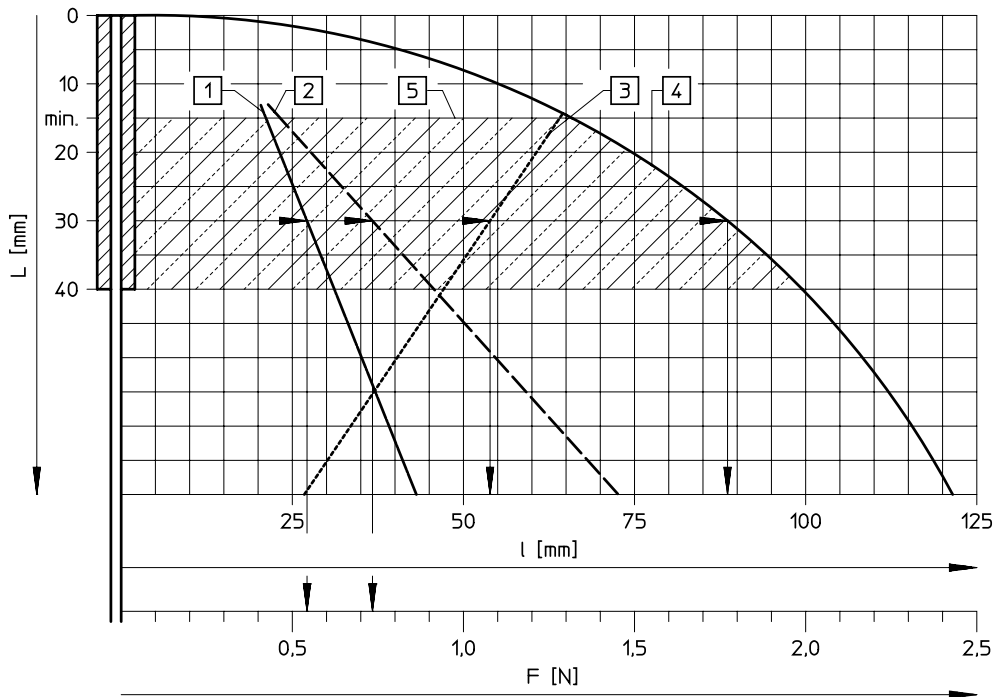
Operating and environmental conditions	
Operating medium	Compressed air to ISO 8573-1:2010 [-:-:-]
Pilot medium	Compressed air to ISO 8573-1:2010 [-:-:-]
Note on operating/ Pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure range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

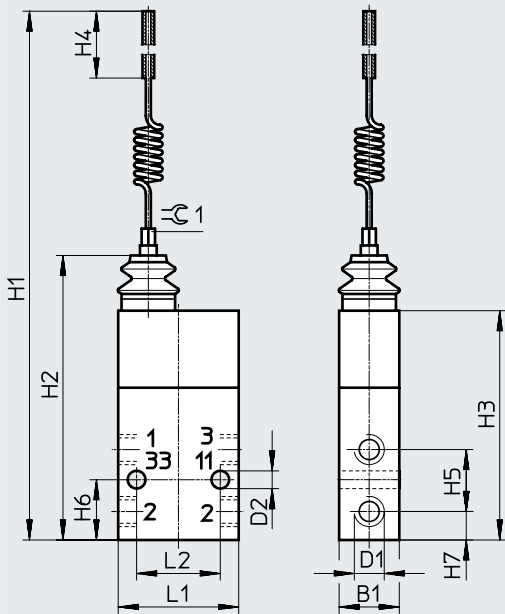
Overtravel 88 mm  
Passing force 0.75 N

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

Dimensions

Download CAD data → [www.festo.com](http://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 <sup>1)</sup>	Part no.	Type
<b>Whisker valve</b>						
146	3/2-way valve, monostable	Whisker valve	Closed	Internal	<b>3876</b>	<b>FVS-3-1/8</b>
175	3/2-way valve, monostable	Whisker valve	open	Internal	<b>3877</b>	<b>FVSO-3-1/8</b>


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

Mounting via through-hole

-  Pressure  
-0.95 ... +8 bar

-  Temperature range  
-10 ... +60°C



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 <sup>1)</sup>	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	[N]	-	16.5	1.7	1.8	2.2
• at 6 bar						
• 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		
PWIS conformity	-		VDMA24364-B1/B2-L	-		

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 <sup>1)</sup>	-		-	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 [l/min]	550	600	600
1 → 2			
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		
PWIS conformity (see declaration of conformity) <sup>1)</sup>	VDMA24364-B1/B2-L		

1) For information about the area of use, see the declaration of conformity at: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.  
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

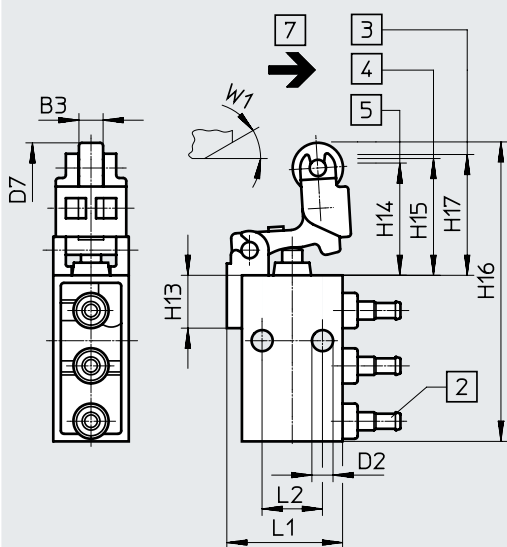


## Datasheet

### Dimensions

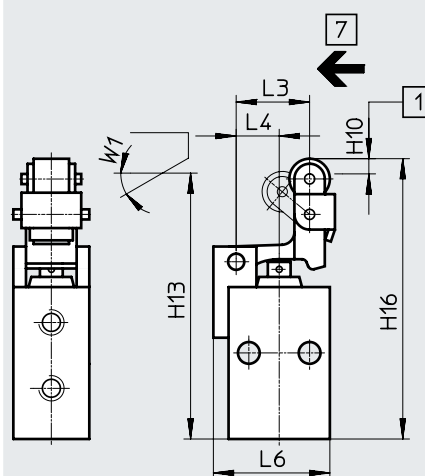
Download CAD data → [www.festo.com](http://www.festo.com)

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

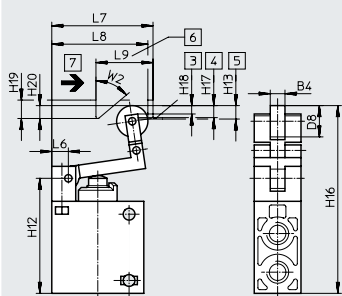
Roller lever valve with idle return L-3-M5



- [1] Switching travel
- [7] Actuation direction

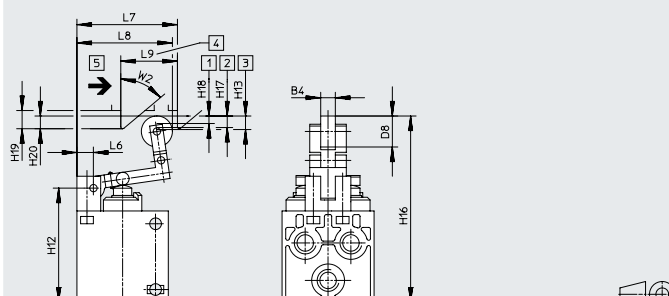
Toggle lever valve	B3	D2 ∅	D7 ∅	L1	L2	L3	L4	L6	H10	H13	H14	H15 +0.25 -0.75	H16	H17 +0.35 -0.7	W1
L/O-3-PK-3	4.8	4.3	10	23	12	-	-	23	-	10.5	22.3	23.2	59.5	24.8	30°
L-3-M5	-	-	-	-	-	14.5	8.5	23	3	52.5	-	-	55.5	-	30°

Roller lever valve L-3-1/4-B, roller lever valve with idle return LO-3-1/4-B



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

Roller lever valve with idle return L-5-1/4-B



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

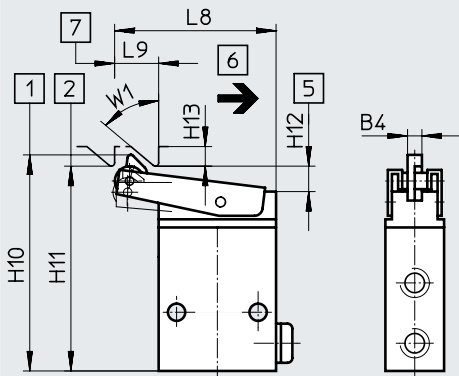
Toggle lever valve	B4	D8 ∅	L6	L7	L8	L9	H12	H13	H16	H17	H18	H19	H20	W2
L-3-1/4-B, LO-3-1/4-B	8	17	9	55	54	31	62.5	7.4	102	6.3	4.1	10	7	50°
L-5-1/4-B	8	17	9	55	54	31	62.5	7.4	102	6.3	4.1	10	7	50°

Datasheet

Dimensions

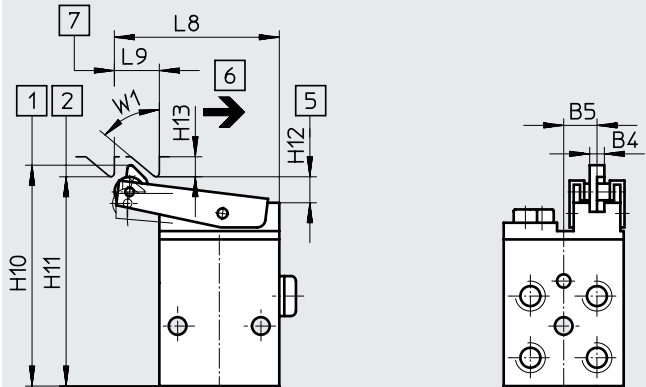
Download CAD data → [www.festo.com](http://www.festo.com)

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

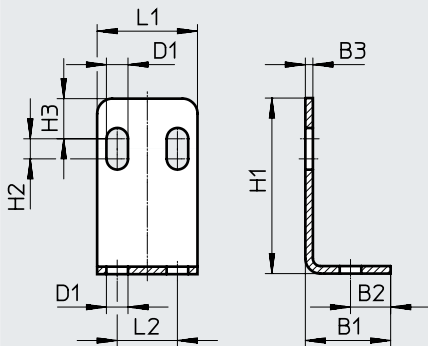
Toggle lever valve LS-4-1/8



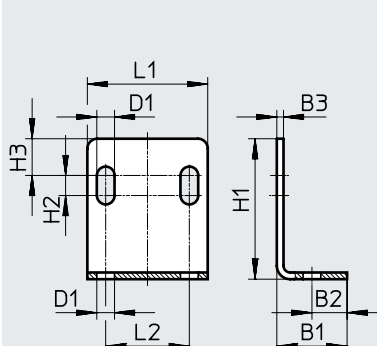
- [1] Initial position
- [2] ON position
- [5] Bottom edge of control rail or control cam
- [6] Idle return
- [7] Min. switching travel

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

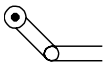


Mounting bracket HV-1/8



Mounting bracket	B1	B2	B3	D1 ∅	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	
<b>Toggle lever valve</b>							
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	
<b>Roller lever valve</b>							
80	3/2-way valve, monostable	Roller lever valve	■	Open/closed	10749	L/O-3-PK-3	
600	3/2-way valve, monostable	Roller lever valve, suitable for vacuum	■	Closed	8982	L-3-1/4-B	
<b>Roller lever valve with idle return</b>							
80	3/2-way valve, monostable	Roller lever valve with idle return, suitable for vacuum	■	Closed	3628	L-3-M5	
550	5/2-way valve, monostable	Roller lever valve with idle return, suitable for vacuum	■	–	8993	L-5-1/4-B	
600	3/2-way valve, monostable	Roller lever valve with idle return, suitable for vacuum	■	Open	8989	LO-3-1/4-B	
<b>Ordering data</b>							
	Description				Part no.	Type	PU <sup>1)</sup>
<b>Actuator attachment</b>							
	For roller lever valve L-3-M5, roller lever with idle return with retaining screws				6513	AL-05	1

1) Packaging unit

Valves, mechanically actuated, roller lever valve, roller actuated valve

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		R/O-3-PK-3	R-3-M5	RS-3-1/8	ROS-3-1/8	RS-4-1/8
Type		Roller lever valve				
Standard nominal flow rate	[l/min]	80		151	169	128
1 → 2						
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 <sup>1)</sup>	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	[N]	-	16.5	1.7	1.9	1.8
• at 6 bar						
• 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

<b>Materials</b>					
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		

<b>Operating and environmental conditions</b>					
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
Temperature of medium	[°C]	-	-10 ... +60		
Ambient temperature	[°C]	-10 ... +60			
Corrosion resistance class CRC <sup>1)</sup>	-	-	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.

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

<b>Materials - Actuator attachment</b>	
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 [l/min] 1 → 2	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

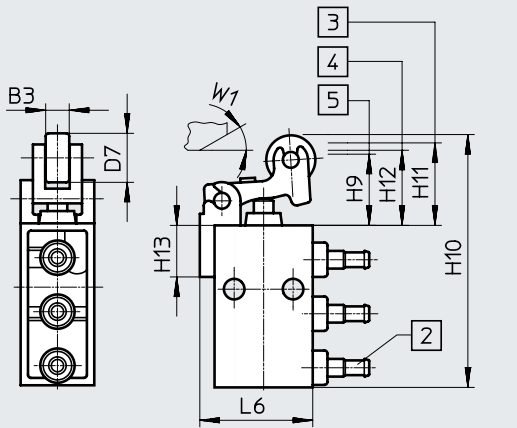
Operating and environmental conditions	
Operating medium	Compressed air to ISO 8573-1:2010 [---:--]
Note on operating/ Pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure range [bar]	-0.95 ... +10
Ambient temperature [°C]	-10 ...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

Datasheet

Dimensions

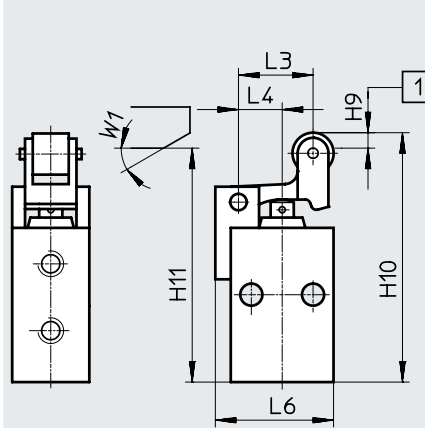
Download CAD data → [www.festo.com](http://www.festo.com)

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

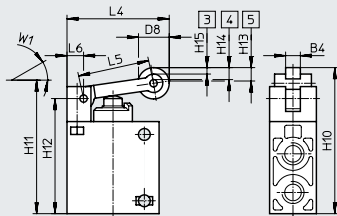
Roller lever valve R-3-M5



- [1] Switching travel

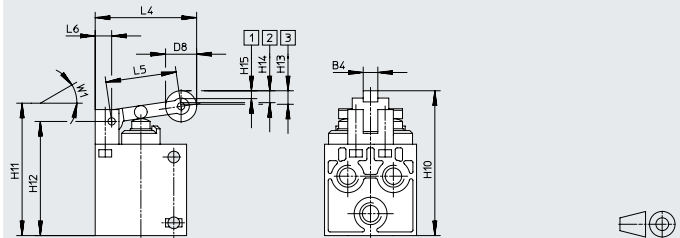
Roller lever valve	B3	D7 ∅	L3	L4	L6	H9	H10	H11	H12	H13	W1
R/O-3-PK-3	4.8	10	-	-	23	14.5	51.5	16.8	15.3	10.5	30°
R-3-M5	-	-	14.5	8.5	23	3	48.5	45.5	-	-	30°

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



- [1] Opening start
- [2] Max. opening
- [3] Max. stroke

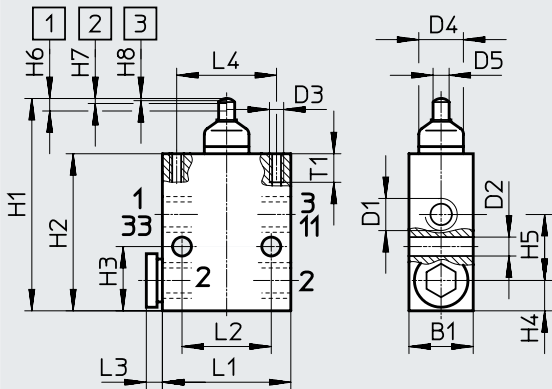
Roller lever valve	B4	D8 ∅	L4	L5	L6	H10	H11 min	H12	H13	H14	H15	W1
R-3-1/4-B, RO-3-1/4-B	8	17	55.5	39	9	79.3	72.5	62.5	7.4	6.5	4.3	30°
R-5-1/4-B	8	17	55.5	39	9	79.3	72.5	62.5	7.4	6.5	4.3	30°

Datasheet

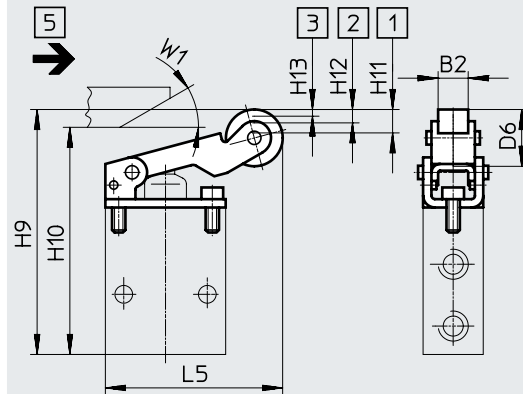
Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

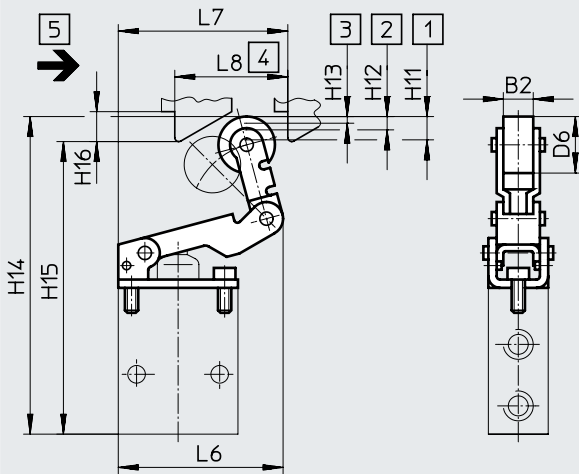
Basic valve, stem actuated valve V/O-3-1/8



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.

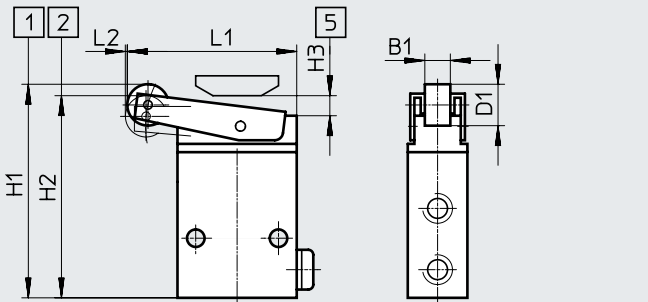


Datasheet

Dimensions

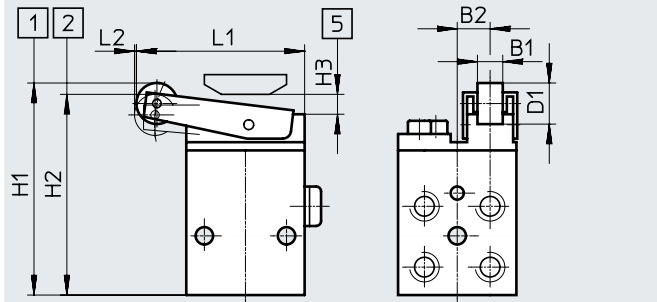
Download CAD data → [www.festo.com](http://www.festo.com)

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

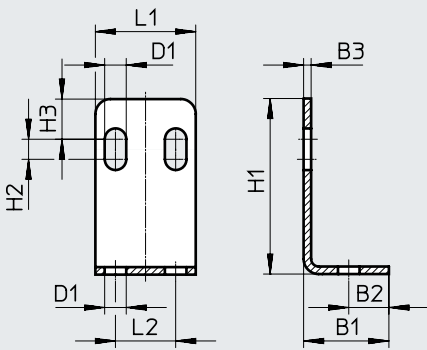
Roller lever valve RS-4-1/8



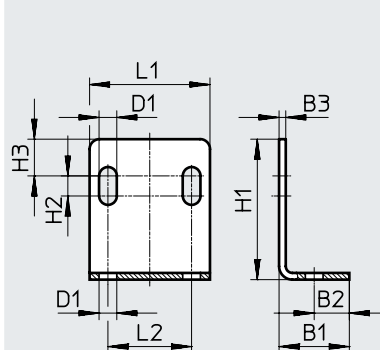
- [1] Initial position
- [2] ON position
- [5] Bottom edge of control rail or control cam

Roller lever valve	B1	B2	D1 ∅	L1	L2	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




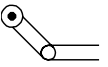

Mounting bracket HV-1/8



Mounting bracket	B1	B2	B3	D1 ∅	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
<b>Roller lever valve</b>						
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 <sup>1)</sup>
<b>Actuator attachment</b>				
	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 <sup>1)</sup>	
<b>Push-in fitting with external hex (mini version)</b>					
	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
<b>Push-in fitting with external hex (standard version)</b>					
	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
<b>Push-in fitting with internal hex (mini version)</b>					
	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
<b>Push-in fitting with internal hex (standard version)</b>					
	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
<b>Silencers</b>					
	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
<b>Mounting bracket</b>					
	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