

**CPC****COOPERATIVE PATENT CLASSIFICATION****F16K**

**VALVES ; TAPS ; COCKS ; ACTUATING-FLOATS ; DEVICES FOR VENTING OR AERATING** { ( devices for emptying and evacuating the excess liquid in valves or conduits [F16L 55/07](#) ) }

**NOTE**

Attention is drawn to the following places:

[A47J 27/09](#) Safety devices for pressure cookers  
[A47J 31/46](#) Dispensing spouts, drain valves or like beverage-making apparatus  
[A61B 5/0235](#) Valves specially adapted for measuring pressure in heart or blood vessels  
[A61F 2/24](#) Heart valves  
[A61M 16/20](#) Valves specially adapted for medical respiratory devices  
[A61M 39/00](#) Tube connectors, tube couplings, valves or branch units specially adapted for medical use in general  
[A62B 9/02](#) Valves for respiratory apparatus  
[A62B 18/10](#) Valves for breathing masks or helmets  
[A62C](#) Fire extinguishers  
{ [B01D 35/04](#) Plug, tap, or cock filters }  
[B05B](#) Nozzles, spray heads or other discharge apparatus for spraying or atomising  
[B60C 29/00](#) Arrangements of tyre-inflating valves relative to tyres or wheel rims; Connection of valves to wheel rims, tyres or other inflatable elastic bodies  
[B60G 17/048](#) Valves specially adapted for adjusting vehicle fluid-spring characteristics  
[B60T](#) Valves specially adapted for vehicle brake control systems  
[B62D 5/08](#) Vehicle power-assisted steering characterised by the type of valve used  
[B63B 7/00](#) ,  
[B63C 9/00](#) Arrangement of inflating valves for floatable life-saving equipment  
[B65D 47/04](#) Container closures with discharging valves  
[B65D 90/32](#) Safety valves for large containers  
[B65D 90/54](#) Gates or closures on large containers  
[B67C 3/28](#) Flow control devices for bottling liquids  
[B67D](#) Dispensing, delivering or transferring liquids  
{ [C21B 9/12](#) Hot-blast valves for blast furnaces }  
[E02B 8/00](#) Details, e.g. valves, of barrages or weirs  
[E02B 13/02](#) Closures for irrigation conduits  
{ [E03C 1/04](#) Water-basin installations specially adapted for wash-basins or baths }  
{ [E03C 1/05](#) Arrangements on wash-basins for the remote control of taps }  
[E03D](#) Flushing valves for water-closets or urinals  
{ [E03F 7/04](#) Valves for preventing return flow in sewer systems }  
[E05F 3/12](#) Valve arrangements in door closers  
[E21B 21/10](#) Valve arrangements in drilling-fluid circulation systems  
[E21B 34/00](#) Valve arrangements for boreholes or wells  
{ [E21D 15/51](#) Arrangement of relief valves in hydraulic mine props }  
[F01B 25/10](#) Working-fluid valves for controlling machines or engines in general or of positive-displacement type

[F01D 17/10](#) Final actuators for controlling non-positive displacement machines or engines  
[F01L](#) Cyclically operated valves for machines or engines  
[F02D 9/08](#) Throttle valves for controlling combustion engines  
[F02K 9/58](#) Propellant feed valves for rocket-engines  
[F02M](#) Carburettors, fuel injection  
[F02M 59/46](#) Valves for fuel injection pumps  
[F04](#) Pumps  
[F16F 9/34](#) Valves for shock absorbers  
[F16L 29/00](#) ,  
[F16L 37/28](#) Pipe joints or quick-acting couplings with fluid cut-off means  
[F16L 55/00](#) Arrangement of valves in pipes  
[F16L 55/055](#) Valves specially adapted to prevent or minimise the effect of water hammer  
[F16L 55/46](#) Launching devices for pigs or moles  
[F16N 23/00](#) Check valves for lubrication systems  
{ [F16T](#) Draining-off liquids from steam traps }  
[F17C 13/04](#) Arrangement of valves in pressure vessels  
[F22B 37/44](#) Arrangement of safety valves on steam boilers  
[F22D 5/34](#) Application of valves to automatic water-feed in boiler  
[F23L 13/00](#) Valves for air supply control to burners  
{ [F23Q 2/16](#) Valves for lighters with gaseous fuel and adjustable flame }  
[F24C 3/12](#) ,  
[F24C 5/16](#) Arrangement of valves on stoves or ranges  
[F24F](#) Air conditioning; Ventilation  
[F25B 41/04](#) Disposition of fluid circulation valves in refrigeration machines  
[G05D](#) Controlling non-electric variables  
[G10B 3/06](#) Valves for organs  
[G10D 9/04](#) Valves for other wind-actuated musical instruments  
{ [G21C 9/06](#) Safety valves structurally associated with nuclear reactors }  
{ [H01M 2/12](#) Vent plugs in batteries or cells }

### **WARNING**

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[F16K 31/11](#) covered by [F16K 31/06](#) , [F16K 31/08](#) , [F16K 31/10](#)  
[F16K 31/64](#) " " [G05D](#)  
[F16K 31/66](#) " " [F16K 31/06](#) ; [H01F](#)  
[F16K 31/68](#) " " [G05D](#)  
[F16K 31/70](#) " " [F16K 31/002](#)  
[F16K 31/72](#) " " [F16K 31/00](#)

**Guidance heading:** **Constructional types ( check valves [F16K 15/00](#) )**

### **NOTE**

In groups [F16K 1/00](#) to [F16K 13/00](#) , an initial seal breaking or final sealing movement which is different from the opening or closing movement of the valve is not considered in determining the movement to be classified.

**F16K 1/00**

**Lift valves { or globe valves } , i.e. cut-off apparatus with closure members having at least a component of their opening and closing motion perpendicular to the**

**closing faces** ( { in combination with sliding valves [F16K 3/246](#) , [F16K 3/267](#) } ;  
diaphragm valves [F16K 7/00](#) )

- F16K 1/02 . with screw-spindle ( [F16K 1/12](#) to [F16K 1/28](#) take precedence; actuating mechanisms with screw-spindles [F16K 31/50](#) )
- F16K 1/04 . . with a cut-off member rigid with the spindle, e.g. main valves
- F16K 1/06 . . Special arrangements for improving the flow, e.g. special shape of passages or casings
- F16K 1/08 . . . in which the spindle is perpendicular to the general direction of flow
- F16K 1/10 . . . in which the spindle is inclined to the general direction of flow
- F16K 1/12 . with streamlined valve member around which the fluid flows when the valve is opened
- F16K 1/123 . . { with stationary valve member and moving sleeve }
- F16K 1/126 . . { actuated by fluid }
- F16K 1/14 . with ball-shaped valve member ( check valves [F16K 15/04](#) )
- F16K 1/16 . with pivoted closure-members
- F16K 1/165 . . { with a plurality of closure members }
- F16K 1/18 . . with pivoted discs or flaps
- F16K 1/20 . . . with axis of rotation arranged externally of valve member

#### **WARNING**

Subgroups of [F16K 1/20](#) are not complete pending a reorganisation, see also [F16K 1/20](#)

- F16K 1/2007 . . . . { specially adapted operating means therefor ( operating means per se [F16K 31/00](#) ) }
- F16K 1/2014 . . . . { Shaping of the valve member }
- F16K 1/2021 . . . . { with a plurality of valve members }
- F16K 1/2028 . . . . { Details of bearings for the axis of rotation }
- F16K 1/2035 . . . . . { the axis of rotation having only one bearing }
- F16K 1/2042 . . . . { Special features or arrangements of the sealing }
- F16K 1/205 . . . . . { the sealing being arranged on the valve member }
- F16K 1/2057 . . . . . { the sealing being arranged on the valve seat }
- F16K 1/2064 . . . . . { with a channel- or U-shaped seal covering a central body portion }
- F16K 1/2071 . . . . . { and being forced into sealing contact with the valve member by a spring or a spring-like member }
- F16K 1/2078 . . . . . { Sealing means for the axis of rotation }
- F16K 1/2085 . . . . . { Movable sealing bodies }
- F16K 1/2092 . . . . . { the movement being caused by the flowing medium }
- F16K 1/22 . . . with axis of rotation crossing the valve member, e.g. butterfly valves
- F16K 1/221 . . . . { specially adapted operating means therefor ( operating means per se [F16K 31/00](#) ) }
- F16K 1/222 . . . . { Shaping of the valve member }

F16K 1/223	....	{ with a plurality of valve members }
F16K 1/224	....	{ Details of bearings for the axis of rotation }
F16K 1/225	.....	{ the axis of rotation having only one bearing }
F16K 1/226	....	Shaping or arrangements of the sealing
F16K 1/2261	.....	{ the sealing being arranged on the valve member }
F16K 1/2263	.....	{ the sealing being arranged on the valve seat }
F16K 1/2265	.....	{ with a channel- or U-shaped seal covering a central body portion }
F16K 1/2266	.....	{ and being forced into sealing contact with the valve member by a spring or a spring-like member }
F16K 1/2268	.....	{ Sealing means for the axis of rotation }
F16K 1/228	.....	Movable sealing bodies
F16K 1/2285	.....	{ the movement being caused by the flowing medium }
F16K 1/24	.	with valve members that, on opening of the valve, are initially lifted from the seat and next are turned around an axis parallel to the seat
F16K 1/26	..	Shape or arrangement of the sealing { Not used }
F16K 1/28	...	Movable sealing bodies { Not used }
F16K 1/30	.	specially adapted for pressure containers
F16K 1/301	..	{ only shut-off valves, i.e. valves without additional means }
F16K 1/302	...	{ with valve member and actuator on the same side of the seat }
F16K 1/303	...	{ with a valve member, e.g. stem or shaft, passing through the seat }
F16K 1/304	..	{ Shut-off valves with additional means }
F16K 1/305	...	{ with valve member and actuator on the same side of the seat }
F16K 1/306	...	{ with a valve member, e.g. stem or shaft, passing through the seat }
F16K 1/307	..	{ Additional means used in combination with the main valve }
F16K 1/308	..	{ Connecting means }
F16K 1/32	.	Details ( details of more general applicability <a href="#">F16K 25/00</a> to <a href="#">F16K 51/00</a> )
F16K 1/34	..	Cutting-off parts, e.g. valve members, seats ( <a href="#">F16K 1/06</a> , <a href="#">F16K 1/12</a> , <a href="#">F16K 1/14</a> , <a href="#">F16K 1/26</a> take precedence )
F16K 1/36	...	Valve members ( for double-seat valves <a href="#">F16K 1/44</a> ) { for butterfly valves <a href="#">F16K 1/222</a> , <a href="#">F16K 1/223</a> }
F16K 1/38	....	of conical shape
F16K 1/385	.....	{ contacting in the closed position, over a substantial axial length, a seat surface having the same inclination }
F16K 1/40	....	of helical shape
F16K 1/42	...	Valve seats ( for double-seat valves <a href="#">F16K 1/44</a> )

**WARNING**

Subgroups of [F16K 1/42](#) are not complete pending a reorganisation, see also [F16K 1/42](#) ]

F16K 1/422	....	{ attachable by a threaded connection to the housing }
F16K 1/425	....	{ Attachment of the seat to the housing by plastical deformation, e.g. valve seat or housing being plastically deformed during mounting }

F16K 1/427	....	{ Attachment of the seat to the housing by one or more additional fixing elements }
F16K 1/44	...	Details of seats or valve members of double-seat valves
F16K 1/443	....	{ the seats being in series }
F16K 1/446	.....	{ with additional cleaning or venting means between the two seats }
F16K 1/46	...	Attachment of sealing rings
F16K 1/465	....	{ to the valve seats }

**WARNING**

Not yet complete, see also [F16K 1/46](#)

F16K 1/48	..	Attaching valve members to screw-spindles
F16K 1/482	...	{ with a collar on the spindle or a groove in the spindle, by which a fixing element is supported, the spindle reaching into the valve member }
F16K 1/485	....	{ with a groove in the spindle }
F16K 1/487	...	{ by a fixing element extending in the axial direction of the spindle, e.g. a screw }
F16K 1/50	..	Preventing rotation of valve members
F16K 1/52	..	Means for additional adjustment of the rate of flow
F16K 1/523	...	{ for limiting the maximum flow rate, using a stop }
F16K 1/526	...	{ for limiting the maximum flow rate, using a second valve }
F16K 1/54	..	Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve

**F16K 3/00**      **Gate valves or sliding valves, i.e. cut-off apparatus with closing members having a sliding movement along the seat for opening and closing ( [F16K 5/00](#) takes precedence; in barrages or weirs [E02B 8/04](#) )**

F16K 3/02	.	with flat sealing faces ; Packings therefor
F16K 3/0209	..	{ the valve having a particular passage, e.g. provided with a filter, throttle or safety device }
F16K 3/0218	..	{ with only one sealing face }
F16K 3/0227	..	{ Packings }
F16K 3/0236	...	{ the packing being of a non-resilient material, e.g. ceramic, metal }
F16K 3/0245	..	{ Curtain gate valves }
F16K 3/0254	..	{ being operated by particular means }
F16K 3/0263	..	{ using particular material or covering means }
F16K 3/0272	..	{ permitting easy assembly or disassembly }
F16K 3/0281	..	{ Guillotine or blade-type valves, e.g. no passage through the valve member }
F16K 3/029	..	{ with two or more gates }
F16K 3/03	..	with a closure member in the form of an iris-diaphragm
F16K 3/04	..	with pivoted closure members
F16K 3/06	...	in the form of closure plates arranged between supply and discharge passages ( <a href="#">F16K 3/10</a> takes precedence )
F16K 3/08	....	with circular plates rotatable around their centres

- F16K 3/085 . . . . . { the axis of supply passage and the axis of discharge passage being coaxial and parallel to the axis of rotation of the plates }
- F16K 3/10 . . . with special arrangements for separating the sealing faces or for pressing them together
- F16K 3/12 . . with wedge-shaped arrangements of sealing faces
- F16K 3/14 . . . with special arrangements for separating the sealing faces or for pressing them together
- F16K 3/16 . . with special arrangements for separating the sealing faces or for pressing them together ( [F16K 3/10](#) , [F16K 3/14](#) take precedence )
- F16K 3/18 . . . by movement of the closure members
- F16K 3/182 . . . . . { by means of toggle links }
- F16K 3/184 . . . . . { by means of cams }
- F16K 3/186 . . . . . { by means of cams of wedge form }
- F16K 3/188 . . . . . { by means of hydraulic forces }
- F16K 3/20 . . . by movement of the seats
- F16K 3/202 . . . . . { by movement of toggle links }
- F16K 3/205 . . . . . { by means of cams }
- F16K 3/207 . . . . . { by means of hydraulic forces }
- F16K 3/22 . with sealing faces shaped as surfaces of solids of revolution ( [F16K 13/02](#) takes precedence; with resilient valve members [F16K 3/28](#) )
- F16K 3/24 . . with cylindrical valve members
- F16K 3/243 . . . { Packings ( [F16K 3/246](#) takes precedence ) }
- F16K 3/246 . . . { Combination of a sliding valve and a lift valve }
- F16K 3/26 . . . with fluid passages in the valve member
- F16K 3/262 . . . . . { with a transverse bore in the valve member }
- F16K 3/265 . . . . . { with a sleeve sliding in the direction of the flow line }
- F16K 3/267 . . . . . { Combination of a sliding valve and a lift valve ( [F16K 3/262](#) , [F16K 3/265](#) take precedence ) }
- F16K 3/28 . with resilient valve members
- F16K 3/30 . Details
- F16K 3/312 . . Line blinds
- F16K 3/314 . . Forms or construction of slides ; Attachment of the slide to the spindle
- F16K 3/316 . . Guiding of the slide
- F16K 3/3165 . . . { with rollers or balls }
- F16K 3/32 . . Means for additional adjustment of the rate of flow
- F16K 3/34 . . Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve
- F16K 3/36 . . Features relating to lubrication
- F16K 5/00** { Plug valves; } **Taps or cocks comprising only cut-off apparatus having at least one of the sealing faces shaped as a more or less complete surface of a solid of revolution, the opening and closing movement being predominantly rotary ( taps of the lift-valve type [F16K 1/00](#) )**

- F16K 5/02 . with plugs having conical surfaces ; Packings therefor
- F16K 5/0207 .. { with special plug arrangement, e.g. special shape or built in means }
- F16K 5/0214 .. { Plug channel at 90 degrees to the inlet }
- F16K 5/0221 .. { Fixed plug and turning sleeve }
- F16K 5/0228 .. { with a conical segment mounted around a supply pipe }
- F16K 5/0235 .. { with the angle the spindle makes housing being other than 90 degrees }
- F16K 5/0242 .. { Spindles and actuating means }
- F16K 5/025 .. { Particular coverings or materials }
- F16K 5/0257 .. { Packings }
- F16K 5/0264 ... { in the housing }
- F16K 5/0271 ... { between housing and plug }
- F16K 5/0278 ... { on the plug }
- F16K 5/0285 ... { spindle sealing }
- F16K 5/0292 .. { Easy mounting or dismounting means }
  
- F16K 5/04 . with plugs having cylindrical surfaces ; Packings therefor
- F16K 5/0407 .. { with particular plug arrangements, e.g. particular shape or built-in means }
- F16K 5/0414 .. { Plug channel at 90 degrees to the inlet }
- F16K 5/0421 .. { Fixed plug and turning sleeve }
- F16K 5/0428 .. { with a cylindrical segment mounted around a supply pipe }
- F16K 5/0435 .. { the angle the spindle makes with the housing being other than 90 degrees }
- F16K 5/0442 .. { Spindles and actuating means }
- F16K 5/045 .. { Particular coverings and materials }
- F16K 5/0457 .. { Packings }
- F16K 5/0464 ... { in the housing }
- F16K 5/0471 ... { between housing and plug }
- F16K 5/0478 ... { on the plug }
- F16K 5/0485 ... { Spindle sealing }
- F16K 5/0492 .. { Easy mounting or dismounting means }
  
- F16K 5/06 . with plugs having spherical surfaces ; Packings therefor
- F16K 5/0605 .. { with particular plug arrangements, e.g. particular shape or built-in means }
- F16K 5/061 .. { knee-joint }
- F16K 5/0615 .. { the angle the spindle makes with the housing being other than 90 degrees }
- F16K 5/0621 .. { with a spherical segment mounted around a supply pipe }
- F16K 5/0626 .. { Easy mounting or dismounting means }
- F16K 5/0631 ... { between two flanges }
- F16K 5/0636 ... { the spherical plug being insertable from the top of the housing }
- F16K 5/0642 ... { the spherical plug being insertable from one and only one side of the housing }
- F16K 5/0647 .. { Spindles or actuating means }
- F16K 5/0652 ... { for remote operation }
- F16K 5/0657 .. { Particular coverings or materials }

- F16K 5/0663      ..      { Packings }
- F16K 5/0668      ...      { Single packings }
- F16K 5/0673      ...      { Composite packings }
- F16K 5/0678      ....      { in which only one of the components of the composite packing is contacting the plug }

### **WARNING**

not yet complete, see also [F16K 5/0673](#)

- F16K 5/0684      ...      { on the plug }
- F16K 5/0689      ...      { between housing and plug }
- F16K 5/0694      ...      { Spindle sealings }
  
- F16K 5/08      .      Details
- F16K 5/10      ..      Means for additional adjustment of the rate of flow
- F16K 5/103      ...      { specially adapted for gas valves }
- F16K 5/106      ....      { with pilot flame }
- F16K 5/12      ..      Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve
- F16K 5/14      ..      Special arrangements for separating the sealing faces or for pressing them together
- F16K 5/16      ...      for plugs with conical surfaces
- F16K 5/161      ....      { with the housing or parts of the housing mechanically pressing the seal against the plug }
- F16K 5/162      ....      { with the plugs or parts of the plugs mechanically pressing the seal against the housing }
- F16K 5/163      .....      { adjustable in height }
- F16K 5/165      .....      { Means pressing on the small diameter }
- F16K 5/166      .....      { Means pressing on the large diameter }
- F16K 5/167      .....      { Means pressing radially }
- F16K 5/168      ....      { Sealing effected by the flowing medium }
- F16K 5/18      ...      for plugs with cylindrical surfaces
- F16K 5/181      ....      { with the housing or parts of the housing mechanically pressing the seals against the plugs }
- F16K 5/182      .....      { by means of conical surfaces }
- F16K 5/184      ....      { with the plugs or parts of the plugs mechanically pressing the seals against the housing }
- F16K 5/185      .....      { by means of conical surfaces }
- F16K 5/187      .....      { with rolling action }
- F16K 5/188      ....      { Sealing effected by the flowing medium }
- F16K 5/20      ...      for plugs with spherical surfaces
- F16K 5/201      ....      { with the housing or parts of the housing mechanically pressing the seal against the plug }
- F16K 5/202      .....      { with conical surfaces }
- F16K 5/204      ....      { with the plugs or parts of the plugs mechanically pressing the seals against the housing }



- F16K 5/205 . . . . { Sealing effected by the flowing medium }
- F16K 5/207 . . . . . { using bellows }
- F16K 5/208 . . . . . { with tongue-shaped means }
- F16K 5/22 . . Features relating to lubrication
- F16K 5/222 . . . { for plugs with conical surfaces }
- F16K 5/225 . . . { for plugs with cylindrical surfaces }
- F16K 5/227 . . . { for plugs with spherical surfaces }

**F16K 7/00** **Diaphragm { valves or } cut-off apparatus, e.g. with a member deformed, but not moved bodily, to close the passage ( container gates or closures operating by deformation of flexible walls [B65D 90/56](#) ; means for plugging pipes or hoses [F16L 55/10](#) ) { Pinch valves }**

- F16K 7/02 . with tubular diaphragm
- F16K 7/04 . . constrictable by external radial force
- F16K 7/045 . . . { by electric or magnetic means }
- F16K 7/06 . . . by means of a screw-spindle, cam, or other mechanical means { ( [F16K 7/045](#) takes precedence ) }
- F16K 7/061 . . . . { Screw clamps }
- F16K 7/063 . . . . { Lever clamps }
- F16K 7/065 . . . . { Cam clamps }
- F16K 7/066 . . . . { Wedge clamps }
- F16K 7/068 . . . . { by bending the hose }
- F16K 7/07 . . . by means of fluid pressure
- F16K 7/075 . . . . { a rigid body being located within the tubular diaphragm }
- F16K 7/08 . . constrictable by twisting
- F16K 7/10 . with inflatable member
- F16K 7/12 . with flat, dished, or bowl-shaped diaphragm
- F16K 7/123 . . { the seat being formed on the bottom of the fluid line }
- F16K 7/126 . . { the seat being formed on a rib perpendicular to the fluid line }
- F16K 7/14 . . arranged to be deformed against a flat seat
- F16K 7/16 . . . the diaphragm being mechanically actuated, e.g. by screw-spindle or cam
- F16K 7/17 . . . the diaphragm being actuated by fluid pressure
- F16K 7/18 . with diaphragm secured at one side only, e.g. to be laid on the seat by rolling action
- F16K 7/20 . with a compressible solid closure member

**F16K 11/00** **Multiple-way valves, e.g. mixing valves ; Pipe fittings incorporating such valves**

- F16K 11/02 . with all movable sealing faces moving as one unit
- F16K 11/022 . . { comprising a deformable member }
- F16K 11/025 . . . { with an O-ring }

F16K 11/027	...	{ the fluid flowing through a constrictable tubular diaphragm }
F16K 11/04	..	comprising only lift valves
F16K 11/044	...	with movable valve members positioned between valve seats
F16K 11/0445	....	{ Bath/shower selectors }
F16K 11/048	...	with valve seats positioned between movable valve members
F16K 11/052	...	with pivoted closure members, e.g. butterfly valves
F16K 11/0525	....	{ the closure members being pivoted around an essentially central axis }
F16K 11/056	...	with ball-shaped valve members
F16K 11/0565	....	{ moving in a combined straight line and rotating movement }
F16K 11/06	..	comprising only sliding valves, { i.e. sliding closure elements }
F16K 11/065	...	with linearly sliding closure members
F16K 11/0655	....	{ with flat slides }
F16K 11/07	....	with cylindrical slides
F16K 11/0704	.....	{ comprising locking elements }
F16K 11/0708	.....	{ comprising means to avoid jamming of the slide or means to modify the flow }
F16K 11/0712	.....	{ comprising particular spool-valve sealing means }
F16K 11/0716	.....	{ with fluid passages through the valve member ( <a href="#">F16K 11/0704</a> , <a href="#">F16K 11/0708</a> , <a href="#">F16K 11/0712</a> take precedence ) }
F16K 11/072	...	with pivoted closure members
F16K 11/074	....	with flat sealing faces
F16K 11/0743	.....	{ with both the supply and the discharge passages being on one side of the closure plates }
F16K 11/0746	.....	{ with two or more closure plates comprising a single lever control }
F16K 11/076	....	with sealing faces shaped as surfaces of solids of revolution
F16K 11/078	...	with pivoted and linearly movable closure members
F16K 11/0782	....	{ Single-lever operated mixing valves with closure members having flat sealing faces }
F16K 11/0785	.....	{ the movable closure member being pivotally supported at one point and being linked to the operating lever at only one other point }
F16K 11/0787	.....	{ with both the supply and the discharge passages being on the same side of the closure members ( <a href="#">F16K 11/0785</a> takes precedence ) }
F16K 11/08	..	comprising only taps or cocks
F16K 11/083	...	with tapered plug
F16K 11/0833	....	{ having all the connecting conduits situated in a single plane perpendicular to the axis of the plug }
F16K 11/0836	....	{ having all the connecting conduits situated in more than one plane perpendicular to the axis of the plug }
F16K 11/085	...	with cylindrical plug
F16K 11/0853	....	{ having all the connecting conduits situated in a single plane perpendicular to the axis of the plug }
F16K 11/0856	....	{ having all the connecting conduits situated in more than one plane perpendicular to the axis of the plug }
F16K 11/087	...	with spherical plug
F16K 11/0873	....	{ the plug being only rotatable around one spindle }

- F16K 11/0876 . . . . . { one connecting conduit having the same axis as the spindle }
- F16K 11/10 . with two or more closure members not moving as an unit
- F16K 11/105 . . { Three-way check or safety valves with two or more closure members }
- F16K 11/12 . . with one plug turning in another
- F16K 11/14 . . operated by one actuating member, e.g. a handle ( with one plug turning in another [F16K 11/12](#) )
- F16K 11/16 . . . which only slides, or only turns, or only swings in one plane
- F16K 11/161 . . . . { only slides }
- F16K 11/163 . . . . { only turns }
- F16K 11/165 . . . . . { with the rotating spindles parallel to the closure members }
- F16K 11/166 . . . . . { with the rotating spindles at right angles to the closure members }
- F16K 11/168 . . . . { only swings }
- F16K 11/18 . . . with separate operating movements for separate closure members
- F16K 11/185 . . . . { with swinging shafts }
- F16K 11/20 . . operated by separate actuating members ( with one plug turning in another [F16K 11/12](#) )
- F16K 11/202 . . . { with concentric handles }
- F16K 11/205 . . . { with two handles at right angles to each other }
- F16K 11/207 . . . { with two handles or actuating mechanisms at opposite sides of the housing }
- F16K 11/22 . . . with an actuating member for each valve, e.g. interconnected to form multiple-way valves
- F16K 11/24 . . . with an electromagnetically-operated valve, e.g. for washing machines
- F16K 13/00** **Other constructional types of cut-off apparatus** ( means for plugging pipes or hoses [F16L 55/10](#) ) ; **Arrangements for cutting-off**
- F16K 13/02 . with both sealing faces shaped as small segments of a cylinder and the moving member pivotally mounted
- F16K 13/04 . with a breakable closure member
- F16K 13/06 . . constructed to be ruptured by an explosion
- F16K 13/08 . Arrangements for cutting-off { not used }
- F16K 13/10 . . by means of liquid or granular medium

**Guidance heading: Functional types**

**NOTE**

Attention is drawn to Note (2) following the title of subclass [G05D](#) and also the subdivisions of that subclass, according to which pressure regulators and flow regulators, e.g. flow regulating valves with pressure compensator, even with the whole regulating system contained in a valve, operating with or without auxiliary power, are covered by groups [G05D 16/00](#) or [G05D 7/00](#) , respectively. However, details of the valve parts, per se, are classified in the appropriate groups of this subclass.

**F16K 15/00**      **Check valves** ( valves specially adapted for inflatable balls [A63B 41/00](#) )

- F16K 15/02      . with guided rigid valve members
- F16K 15/021    .. { the valve member being a movable body around which the medium flows when the valve is open ( [F16K 15/025](#) to [F16K 15/12](#) take precedence ) }

**WARNING**

not yet complete

- F16K 15/023    ... { the valve member consisting only of a predominantly disc-shaped flat element }

**WARNING**

not yet complete

- F16K 15/025    .. { the valve being loaded by a helicoidal spring ( [F16K 15/03](#) to [F16K 15/12](#) take precedence ) }

- F16K 15/026    ... { the valve member being a movable body around which the medium flows when the valve is open }

- F16K 15/028    .... { the valve member consisting only of a predominantly disc-shaped flat element }

- F16K 15/03    .. with a hinged closure member

- F16K 15/031    ... { the hinge being flexible ( [F16K 15/035](#) takes precedence ) }

- F16K 15/033    ... { spring-loaded ( [F16K 15/035](#) takes precedence ) }

- F16K 15/035    ... { with a plurality of valve members }

- F16K 15/036    .... { Dual valve members with hinges crossing the flow line substantially diametrical }

- F16K 15/038    ..... { having a common hinge }

- F16K 15/04    .. shaped as balls

- F16K 15/042    ... { with a plurality of balls }

- F16K 15/044    ... { spring-loaded ( [F16K 15/042](#) takes precedence ) }

- F16K 15/046    .... { by a spring other than a helicoidal spring }

- F16K 15/048    ... { Ball features }

**WARNING**not yet complete, see also [F16K 15/04](#)

- F16K 15/06    .. with guided stems

- F16K 15/063    ... { the valve being loaded by a helicoidal spring }

**WARNING**not yet complete, see also [F16K 15/06](#)

- F16K 15/066    .... { with a plurality of valve members }

- F16K 15/08    .. shaped as rings

- F16K 15/10 . . . integral with, or rigidly fixed to, a common valve plate
- F16K 15/12 . . . Springs for ring valves
  
- F16K 15/14 . with flexible valve members
- F16K 15/141 . . { the closure elements not being fixed to the valve body }
- F16K 15/142 . . . { the closure elements being shaped as solids of revolution, e.g. toroidal or cylindrical rings }
- F16K 15/144 . . { the closure elements being fixed along all or a part of their periphery }
- F16K 15/145 . . . { the closure elements being shaped as a solids of revolution, e.g. cylindrical or conical }
- F16K 15/147 . . . { the closure elements having specially formed slits or being of an elongated easily collapsible form }
- F16K 15/148 . . { the closure elements being fixed in their centre }
- F16K 15/16 . . with tongue-shaped laminae
  
- F16K 15/18 . with actuating mechanism ; Combined check valves and actuated valves
- F16K 15/181 . . { for check valves with a hinged closure member ( [F16K 15/188](#) takes precedence ) }
- F16K 15/183 . . { for ball check valves ( [F16K 15/186](#) , [F16K 15/188](#) take precedence ) }
- F16K 15/185 . . { for check valves with flexible valve members ( [F16K 15/188](#) takes precedence ) }
- F16K 15/186 . . { Check valves which can be actuated by a pilot valve }
- F16K 15/188 . . { Check valves combined with valves having a rotating tap or cock }
  
- F16K 15/20 . specially designed for inflatable bodies, e.g. tyres ( [connecting valves to inflatable bodies B60C 29/00](#) )
- F16K 15/202 . . { and with flexible valve member }
- F16K 15/205 . . { and with closure plug }
- F16K 15/207 . . { and combined with other valves, e.g. safety valves }
  
- F16K 17/00** **Safety valves ; Equalising valves, { e.g. pressure relief valves }**
  
- F16K 17/003 . { reacting to pressure and temperature }
- F16K 17/006 . { specially adapted for shelters }
- F16K 17/02 . opening on surplus pressure on one side ; closing on insufficient pressure on one side ( [check valves F16K 15/00](#) )
- F16K 17/025 . . { and remaining open after return of the normal pressure }

**WARNING**

This group is not complete pending a reorganisation, see also [F16K 17/02](#)

- F16K 17/04 . . spring-loaded
- F16K 17/0406 . . . { in the form of balls }
- F16K 17/0413 . . . { in the form of closure plates }
- F16K 17/042 . . . { with locking or disconnecting arrangements }

F16K 17/0426	...	{ with seat protecting means }
F16K 17/0433	...	{ with vibration preventing means }
F16K 17/044	...	{ with more than one spring }
F16K 17/0446	...	{ with an obturating member having at least a component of their opening and closing motion not perpendicular to the closing faces }
F16K 17/0453	....	{ the member being a diaphragm }
F16K 17/046	....	{ the valve being of the gate valve type or the sliding valve type }

**WARNING**

not yet complete, see also [F16K 17/0446](#)

F16K 17/0466	...	{ with a special seating surface }
F16K 17/0473	...	{ Multiple-way safety valves }
F16K 17/048	...	{ combined with other safety valves, or with pressure control devices }
F16K 17/0486	...	{ with mechanical actuating means }
F16K 17/0493	...	{ with a spring other than a helicoidal spring }
F16K 17/06	...	with special arrangements for adjusting the opening pressure
F16K 17/065	....	{ with differential piston }
F16K 17/08	...	with special arrangements for providing a large discharge passage
F16K 17/082	....	{ with piston }
F16K 17/085	....	{ with diaphragm }
F16K 17/087	....	{ with bellows }
F16K 17/10	...	with auxiliary valve for fluid operation of the main valve
F16K 17/105	....	{ using choking or throttling means to control the fluid operation of the main valve }
F16K 17/12	..	weight-loaded
F16K 17/14	..	with fracturing member
F16K 17/16	...	with fracturing diaphragm; { Rupture discs }
F16K 17/1606	....	{ of the reverse-buckling-type ( <a href="#">F16K 17/1633</a> takes precedence ) }
F16K 17/1613	.....	{ with additional cutting means }
F16K 17/162	....	{ of the non reverse-buckling-type ( <a href="#">F16K 17/1633</a> takes precedence ) }
F16K 17/1626	.....	{ with additional cutting means }
F16K 17/1633	....	{ made of graphite }
F16K 17/164	..	and remaining closed after return of the normal pressure
F16K 17/168	..	combined with manually-controlled valves, e.g. a valve combined with a safety valve
F16K 17/18	.	opening on surplus pressure on either side
F16K 17/19	..	Equalising valves predominantly for tanks { when combined with safety valve by change of position <a href="#">F16K 17/36</a> }
F16K 17/192	...	with closure member in the form of a movable liquid column
F16K 17/194	...	weight-loaded
F16K 17/196	...	spring-loaded
F16K 17/20	.	Excess-flow valves ( <a href="#">actuated in consequence of shock or similar extraneous</a>

influence [F16K 17/36](#) )

- F16K 17/205 . . { specially adapted for flexible gas lines }
- F16K 17/22 . . actuated by the difference of pressure between two places in the flow line
- F16K 17/24 . . . acting directly on the cutting-off member
- F16K 17/26 . . . . operating in either direction
- F16K 17/28 . . . . operating in one direction only
- F16K 17/285 . . . . { the cutting-off member being a ball ( [F16K 17/30](#) takes precedence ) }
- F16K 17/30 . . . . spring-loaded
- F16K 17/32 . . . acting on a servo-mechanism or on a catch-releasing mechanism
- F16K 17/34 . . in which the flow-energy of the flowing medium actuates the closing mechanism
  
- F16K 17/36 . . actuated in consequence of extraneous circumstances, e.g. shock, change of position
- F16K 17/363 . . { the closure members being rotatable or pivoting ( [F16K 17/386](#) takes precedence ) }
- F16K 17/366 . . { the closure member being a movable ball ( [F16K 17/38](#) takes precedence ) }

### **WARNING**

not yet complete, see also [F16K 17/36](#)

- F16K 17/38 . . of excessive temperature
- F16K 17/383 . . . { the valve comprising fusible, softening or meltable elements, e.g. used as link, blocking element, seal, closure plug ( [F16K 17/386](#) takes precedence ) }
- F16K 17/386 . . . { the closure members being rotatable or pivoting }
  
- F16K 17/40 . . with a fracturing member, e.g. fracturing diaphragm, glass, fusible joint ( valves opening on surplus pressure [F16K 17/14](#) )
- F16K 17/403 . . { with a fracturing valve member }
- F16K 17/406 . . { the fracturing member being a generally elongated member, e.g. rod or wire, which is directly connected to a movable valve member, the breaking or buckling of the elongated member allowing the valve member to move to a closed or open position }
  
- F16K 17/42 . . Valves preventing penetration of air in the outlet of containers for liquids

### **F16K 19/00 Arrangements of valves and flow lines specially adapted for mixing fluids ( multiple-way valves [F16K 11/00](#) )**

- F16K 19/003 . . { Specially adapted for boilers }
- F16K 19/006 . . { Specially adapted for faucets }

### **F16K 21/00 Fluid-delivery valves, { e.g. self-closing valves } ( for liquid handling [B67D](#) ; for flushing devices for water-closets or the like [E03D](#) )**

- F16K 21/02 . . providing a continuous small flow
- F16K 21/04 . . Self-closing valves, i.e. closing automatically after operation { pneumatic tools }

[9/00](#) }

- F16K 21/06 . . in which the closing movement, either retarded or not, starts immediately after opening
- F16K 21/08 . . . with ball-shaped closing members
- F16K 21/10 . . . with hydraulic brake cylinder acting on the closure member
- F16K 21/12 . . . with hydraulically-operated opening means ; with arrangements for pressure relief before opening
- F16K 21/14 . . with special means for preventing the self-closing
- F16K 21/16 . . closing after a predetermined quantity of fluid has been delivered ( [F16K 21/10 takes precedence](#) )
- F16K 21/165 . . . { with means sensing the weight of said fluid quantity }

#### **WARNING**

not yet complete, see also [F16K 21/16](#)

- F16K 21/18 . . closed when a rising liquid reaches a predetermined level ( [float-actuated valves F16K 31/18](#) )
- F16K 21/185 . . . { with electrical or magnetical means, e.g. with magnetic floats, for sensing the liquid level }

#### **WARNING**

not yet complete, see also [F16K 21/18](#)

- F16K 21/20 . . . by means making use of air-suction through an opening closed by the rising liquid

### **F16K 23/00 Valves for preventing drip from nozzles**

**F16K 24/00** **Devices, e.g. valves, for venting or aerating enclosures** ( [equalising valves F16K 17/00](#) ; arrangement or mounting in pipes or pipe systems [F16L 55/07](#) ; venting or aerating as an additional function of steam traps or like apparatus [F16T](#) ; ventilation of rooms, vehicles, see the appropriate subclass, e.g. [F24F](#) )

- F16K 24/02 . the enclosure being itself a valve, tap, or cock
- F16K 24/04 . for venting only ( [F16K 24/02 takes precedence](#) )
- F16K 24/042 . . { [actuated by a float](#) }
- F16K 24/044 . . . { the float being rigidly connected to the valve element, the assembly of float and valve element following a substantially translational movement when actuated, e.g. also for actuating a pilot valve }

#### **WARNING**

not yet complete, see also [F16K 24/042](#)

- F16K 24/046 . . . . { [the assembly of float and valve element being a single spherical element](#) }
- F16K 24/048 . . . { [a transmission element, e.g. arm, being interposed between the float and the valve element, the transmission element following a non-translational, e.g.](#)



pivoting or rocking, movement when actuated }

F16K 24/06 . for aerating only ( [F16K 24/02](#) takes precedence )

**Guidance heading: Details**

**NOTE**

Details not provided for in the following groups are classified in the preceding groups.

**F16K 25/00** **Details relating to contact between valve members and seat** ( sealing constructions, see the appropriate groups according to the type of valve; movement of valve members other than for opening and closing [F16K 29/00](#) )

F16K 25/005 . { Particular materials for seats or closure elements }

F16K 25/02 . Arrangements using fluid issuing from valve members or seats

F16K 25/04 . Arrangements for preventing erosion, not otherwise provided for

**F16K 27/00** **Construction of housing** ( methods for welding housings [B23K](#) ) ; **Use of materials therefor**

F16K 27/003 . { Housing formed from a plurality of the same valve elements }

F16K 27/006 . { of hydrants }

F16K 27/02 . of lift valves ( for reducing the flow resistance of screw-spindle lift-valves [1/06](#) )

F16K 27/0209 .. { Check valves or pivoted valves }

F16K 27/0218 ... { Butterfly valves }

F16K 27/0227 ... { with the valve members swinging around an axis located at the edge of or outside the valve member }

F16K 27/0236 .. { Diaphragm cut-off apparatus }

F16K 27/0245 .. { with ball-shaped valve members }

F16K 27/0254 .. { with conical shaped valve members }

F16K 27/0263 .. { multiple way valves }

F16K 27/0272 .. { valves provided with a lining }

F16K 27/0281 .. { Housings in two parts which can be orientated in different positions }

F16K 27/029 .. { Electromagnetically actuated valves }

**WARNING**

This group is not complete pending a reorganisation, see also [F16K 27/02](#)

F16K 27/04 . of sliding valves

F16K 27/041 .. { cylindrical slide valves }

- F16K 27/042 . . . { Hydraulic fluid leak traps }
- F16K 27/044 . . { slide valves with flat obturating members }
- F16K 27/045 . . . { with pivotal obturating members }
- F16K 27/047 . . . { with wedge-shaped obturating members }
- F16K 27/048 . . { Electromagnetically actuated valves }

**WARNING**

This group is not complete pending a reorganisation, see also [F16K 27/04](#)

- F16K 27/06 . of taps or cocks
- F16K 27/062 . . { with conical plugs }
- F16K 27/065 . . { with cylindrical plugs }
- F16K 27/067 . . { with spherical plugs }
- F16K 27/07 . of cutting-off parts of tanks, e.g. tank-ears

**WARNING**

This group is not complete pending a reorganisation, see also [F16K 51/00](#)

- F16K 27/08 . Guiding yokes for spindles ; Means for closing housings ; Dust caps, e.g. for tyre valves
- F16K 27/10 . Welded housings
- F16K 27/102 . . { for lift-valves }
- F16K 27/105 . . { for gate valves }
- F16K 27/107 . . { for taps or cocks }
- F16K 27/12 . Covers for housings

**F16K 29/00 Arrangements for movement of valve members other than for opening and closing the valve, e.g. for grinding-in, for preventing sticking**

- F16K 29/02 . providing for continuous motion

**F16K 31/00 { Actuating devices; } Operating means ; Releasing devices { ( regulating means [G05D](#) ) }**

- F16K 31/001 . { actuated by volume variations caused by an element soluble in a fluid or swelling in contact with a fluid ( life-boats [B63C 9/24](#) ) }
- F16K 31/002 . { actuated by temperature variation ( thermo-electric [F16K 31/025](#) ) }
- F16K 31/003 . { operated without a stable intermediate position, e.g. with snap action ( [F16K 31/56](#) takes precedence ) }
- F16K 31/004 . { actuated by piezo-electric means }

- F16K 31/005 .. { Piezo-electric benders }
- F16K 31/006 ... { having a free end }
- F16K 31/007 .. { Piezo-electric stacks }
- F16K 31/008 ... { for sliding valves }

**WARNING**

This group is not complete pending a reorganisation, see also [F16K 31/007](#)

- F16K 31/02 . electric { ( [F16K 31/004](#) takes precedence ) } ; magnetic
- F16K 31/025 .. { actuated by thermo-electric means }
- F16K 31/04 .. using a motor
- F16K 31/041 ... { for rotating valves ( [F16K 31/055](#) takes precedence ) }

**WARNING**

Subgroups [F16K 31/042](#) to [F16K 31/045](#) are not complete pending a reorganisation, see also [F16K 31/04 B](#)

- F16K 31/042 .... { with electric means, e.g. for controlling the motor or a clutch between the valve and the motor }
- F16K 31/043 .... { characterised by mechanical means between the motor and the valve, e.g. lost motion means reducing backlash, clutches, brakes or return means }
- F16K 31/045 ..... { with torque limiters }
- F16K 31/046 ... { with electric means, e.g. electric switches, to control the motor or to control a clutch between the valve and the motor ( [F16K 31/041](#) takes precedence ) }
- F16K 31/047 ... { characterised by mechanical means between the motor and the valve, e.g. lost motion means reducing backlash, clutches, brakes or return means ( [F16K 31/043](#) takes precedence ) }
- F16K 31/048 .... { with torque limiters ( [F16K 31/041](#) takes precedence ) }
- F16K 31/05 ... specially adapted for operating hand-operated valves or for combined motor and hand operation
- F16K 31/055 .... { for rotating valves }
- F16K 31/06 .. using a magnet { e.g. diaphragm valves, cutting off by means of a liquid }
- F16K 31/0603 ... { Multiple-way valves }
- F16K 31/0606 .... { fluid passing through the solenoid coil }
- F16K 31/061 .... { Sliding valves }
- F16K 31/0613 ..... { with cylindrical slides }
- F16K 31/0617 ..... { with flat slides }
- F16K 31/062 .... { the valve element being at least partially ball-shaped }
- F16K 31/0624 .... { Lift valves }
- F16K 31/0627 ..... { with movable valve member positioned between seats }
- F16K 31/0631 ..... { with ball shaped valve members }
- F16K 31/0634 ..... { with fixed seats positioned between movable valve members }
- F16K 31/0637 ..... { with ball shaped valve members }
- F16K 31/0641 .... { the valve member being a diaphragm }

F16K 31/0644	...	{ One-way valve }
F16K 31/0648	....	{ the armature and the valve member forming one element ( <a href="#">F16K 31/0651</a> takes precedence ) }
F16K 31/0651	....	{ the fluid passing through the solenoid coil }
F16K 31/0655	....	{ Lift valves }
F16K 31/0658	.....	{ Armature and valve member being one single element }
F16K 31/0662	.....	{ with a ball-shaped valve member }
F16K 31/0665	.....	{ with valve member being at least partially ball-shaped ( <a href="#">F16K 31/0662</a> takes precedence ) }
F16K 31/0668	....	{ Sliding valves }
F16K 31/0672	....	{ the valve member being a diaphragm }
F16K 31/0675	...	{ Electromagnet aspects, e.g. electric supply therefor }
F16K 31/0679	....	{ with more than one energising coil }
F16K 31/0682	...	{ with an articulated or pivot armature }
F16K 31/0686	...	{ Braking, pressure equilibration, shock absorbing }
F16K 31/0689	....	{ Braking of the valve element }
F16K 31/0693	....	{ Pressure equilibration of the armature }
F16K 31/0696	....	{ Shock absorbing, e.g. using a dash-pot }
F16K 31/08	...	using a permanent magnet
F16K 31/082	....	{ using a electromagnet and a permanent magnet }
F16K 31/084	....	{ the magnet being used only as a holding element to maintain the valve in a specific position, e.g. check valves ( <a href="#">F16K 31/082</a> , <a href="#">F16K 31/086</a> take precedence ) }
F16K 31/086	....	{ the magnet being movable and actuating a second magnet connected to the closing element }
F16K 31/088	.....	{ the movement of the first magnet being a rotating or pivoting movement }
F16K 31/10	...	with additional mechanism between armature and closure member
F16K 31/105	....	{ for rotating valves }
F16K 31/12	.	actuated by fluid ( { fluid-actuated lift valves <a href="#">F16K 1/126</a> } ; fluid-actuated check valves <a href="#">F16K 15/00</a> ; fluid-actuated safety valves <a href="#">F16K 17/00</a> )
F16K 31/122	..	{ the fluid acting on a piston ( <a href="#">F16K 31/143</a> , <a href="#">F16K 31/163</a> , <a href="#">F16K 31/363</a> , <a href="#">F16K 31/383</a> take precedence ) }
F16K 31/1221	...	{ one side of the piston being spring-loaded }
F16K 31/1223	...	{ one side of the piston being acted upon by the circulating fluid }
F16K 31/1225	...	{ with a plurality of pistons }
F16K 31/1226	...	{ the fluid circulating through the piston }
F16K 31/1228	...	{ with a stationnary piston }
F16K 31/124	...	servo actuated
F16K 31/1245	....	{ with more than one valve }
F16K 31/126	..	{ the fluid acting on a diaphragm, bellows, or the like ( <a href="#">F16K 31/145</a> , <a href="#">F16K 31/165</a> , <a href="#">F16K 31/365</a> , <a href="#">F16K 31/385</a> take precedence ) }
F16K 31/1262	...	{ one side of the diaphragm being spring loaded }
F16K 31/1264	....	{ with means to allow the side on which the springs are positioned to be

		altered }
F16K 31/1266	...	{ one side of the diaphragm being acted upon by the circulating fluid }
F16K 31/1268	...	{ with a plurality of the diaphragms }
F16K 31/128	...	servo actuated
F16K 31/14	..	for mounting on, or in combination with, hand-actuated valves
F16K 31/143	...	the fluid acting on a piston
F16K 31/145	...	the fluid acting on a diaphragm
F16K 31/16	..	with a mechanism, other than pulling-or pushing-rod, between fluid motor and closure member ( <a href="#">with float F16K 31/18</a> )
F16K 31/163	...	the fluid acting on a piston
F16K 31/1635	....	{ for rotating valves }
F16K 31/165	...	the fluid acting on a diaphragm
F16K 31/1655	....	{ for rotating valves }
F16K 31/18	..	actuated by a float ( <a href="#">floats F16K 33/00</a> ; float-actuated valves in steam-traps <a href="#">F16T 1/20</a> , in boilers <a href="#">F22D 5/08</a> )
F16K 31/20	...	actuating a lift valve
F16K 31/22	....	with the float rigidly connected to the valve
F16K 31/24	....	with a transmission with parts linked together from a single float to a single valve
F16K 31/26	.....	with the valve guided for rectilinear movement and the float attached to a pivoted arm
F16K 31/265	.....	{ with a second lever or toggle between the pivoted arm and the valve }
F16K 31/28	....	with two ore more floats actuating one valve
F16K 31/30	...	actuating a gate valve or sliding valve
F16K 31/32	...	actuating a tap or cock
F16K 31/34	...	acting on pilot valve controlling the cut-off apparatus
F16K 31/36	..	in which fluid from the circuit is constantly supplied to the fluid motor
F16K 31/363	...	the fluid acting on a piston ( <a href="#">F16K 31/38</a> takes precedence )
F16K 31/365	...	the fluid acting on a diaphragm
F16K 31/38	...	in which the fluid works directly on both sides of the fluid motor, one side being connected by means of a restricted passage and the motor being actuated by operating a discharge from that side ( <a href="#">F16K 31/40</a> takes precedence )
F16K 31/383	....	the fluid acting on a piston
F16K 31/3835	.....	{ the discharge being effected through the piston and being blockable by a mechanically-actuated member making contact with the piston }
F16K 31/385	....	the fluid acting on a diaphragm
F16K 31/3855	.....	{ the discharge being effected through the diaphragm and being blockable by a mechanically-actuated member making contact with the diaphragm }
F16K 31/40	...	with electrically-actuated member in the discharge of the motor
F16K 31/402	....	{ acting on a diaphragm }
F16K 31/404	.....	{ the discharge being effected through the diaphragm and being blockable by an electrically-actuated member making contact with the diaphragm }
F16K 31/406	....	{ acting on a piston }

- F16K 31/408 . . . . . { the discharge being effected through the piston and being blockable by an electrically-actuated member making contact with the piston }
- F16K 31/42 . . by means of electrically-actuated members in the supply or discharge conduits of the fluid motor ( [F16K 31/40](#) takes precedence )
- F16K 31/423 . . . { the actuated members consisting of multiple way valves }
- F16K 31/426 . . . { the actuated valves being cylindrical sliding valves }
- F16K 31/44 . Mechanical actuating means
- F16K 31/445 . . { with exterior sleeve }
- F16K 31/46 . . for remote operation
- F16K 31/465 . . { by flexible transmission means, e.g. cable, chain, bowden wire }

**WARNING**

not complete, see also [F16K 31/46](#)

- F16K 31/48 . . actuated by mechanical timing-device, e.g. with dash-pot ( [self-closing valves F16K 21/16](#) )
- F16K 31/485 . . . { and specially adapted for gas valves }
- F16K 31/50 . . with screw-spindle { or internally threaded actuating means }
- F16K 31/502 . . . { actuating pivotable valve members }
- F16K 31/504 . . . { the actuating means being rotatable, rising, and having internal threads which co-operate with threads on the outside of the valve body }
- F16K 31/506 . . . { with plural sets of thread, e.g. with different pitch }

**WARNING**

not yet complete, see also [F16K 31/50](#)

- F16K 31/508 . . . { the actuating element being rotatable, non-rising, and driving a non-rotatable axially-sliding element }

**WARNING**

not yet complete, see also [F16K 31/50](#)

- F16K 31/52 . . with crank, eccentric, or cam
- F16K 31/521 . . . { comprising a pivoted disc or flap }
- F16K 31/522 . . . { comprising a tap or cock }
- F16K 31/523 . . . { comprising a sliding valve }
- F16K 31/524 . . . with a cam
- F16K 31/52408 . . . . { comprising a lift valve }
- F16K 31/52416 . . . . { comprising a multiple-way lift valve }
- F16K 31/52425 . . . . { with a ball-shaped valve member }
- F16K 31/52433 . . . . { with a streamlined or helically shaped valve member, e.g. for reducing flow losses or guiding the fluid flow }
- F16K 31/52441 . . . . { with a pivoted disc or flap }
- F16K 31/5245 . . . . { with a valve member of conical shape }
- F16K 31/52458 . . . . { comprising a tap or cock }

F16K 31/52466	.....	{ comprising a multiple-way tap or cock }
F16K 31/52475	....	{ comprising a sliding valve }
F16K 31/52483	.....	{ comprising a multiple-way sliding valve }
F16K 31/52491	....	{ comprising a diaphragm cut-off apparatus }
F16K 31/528	...	with pin and slot
F16K 31/5282	....	{ comprising a pivoted disc or flap }
F16K 31/5284	....	{ comprising a tap or cock }
F16K 31/5286	....	{ comprising a sliding valve }
F16K 31/5288	....	{ comprising a diaphragm cut-off apparatus }
F16K 31/53	..	with toothed gearing
F16K 31/535	...	{ for rotating valves ( <a href="#">F16K 31/54</a> takes precedence ) }
F16K 31/54	...	with pinion and rack
F16K 31/56	..	without stable intermediate position, e.g. with snap action
F16K 31/563	...	{ for rotating or pivoting valves }
F16K 31/566	...	{ using a bistable spring device arranged symmetrically around the actuating stem }
F16K 31/58	..	comprising a movable discharge-nozzle
F16K 31/60	..	Handles { form, features or function of taps or faucet handles for domestic plumbing installations <a href="#">E03C 1/04</a> }
F16K 31/602	...	{ Pivoting levers, e.g. single-sided ( <a href="#">F16K 31/605</a> takes precedence ) }
F16K 31/605	...	{ for single handle mixing valves }
F16K 31/607	...	{ characterised by particular material, by special measures to obtain aesthetical effects, or by auxiliary functions, e.g. storage }

**WARNING**

not complete, see also [F16K 31/60](#)

F16K 31/62	..	Pedals or like operating members, e.g. actuated by knee or hip
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<b>F16K 33/00</b>	<b>Floats for actuation of valves or other apparatus { ( float actuated valves <a href="#">F16K 31/18</a> ) }</b>
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**F16K 35/00 Means to prevent accidental or unauthorised actuation**

F16K 35/02	.	to be locked or disconnected by means of a pushing or pulling action
F16K 35/022	..	{ the locking mechanism being actuated by a separate actuating element }
F16K 35/025	...	{ said actuating element being operated manually ( e.g. a push-button located in the valve actuator ) }
F16K 35/027	..	{ the locking mechanism being actuated by pushing or pulling the valve actuator, the valve actuator being rotated subsequently to bring the valve closure element in the desired position }
F16K 35/04	.	Yieldingly resisting the actuation
F16K 35/06	.	using a removable actuating or locking member, e.g. a key ( <a href="#">F16K 35/10</a> , <a href="#">F16K 35/12</a> take precedence )

F16K 35/08 . requiring setting according to a code, e.g. permutation locks

F16K 35/10 . with locking caps or locking bars

F16K 35/12 . with sealing wire

F16K 35/14 . interlocking two or more valves

F16K 35/16 . with locking member actuated by magnet

### **F16K 37/00 Special means in or on valves or other cut-off apparatus for indicating or recording operation thereof, or for enabling an alarm to be given**

F16K 37/0008 . { Mechanical means ( [F16K 37/0075](#) takes precedence ) }

F16K 37/0016 . . { having a graduated scale }

F16K 37/0025 . { Electrical or magnetic means ( [F16K 37/0075](#) takes precedence ) }

F16K 37/0033 . . { using a permanent magnet, e.g. in combination with a reed relays }

F16K 37/0041 . . { for measuring valve parameters ( [F16K 37/0033](#) takes precedence ) }

F16K 37/005 . . { for measuring fluid parameters ( [F16K 37/0033](#) takes precedence ) }

F16K 37/0058 . [Optical means, e.g. light transmission, observation ports ( [F16K 37/0075](#) takes precedence ) ]

F16K 37/0066 . { Hydraulic or pneumatic means ( [F16K 37/0075](#) takes precedence ) }

F16K 37/0075 . { For recording or indicating the functioning of a valve in combination with test equipment }

F16K 37/0083 . . { by measuring valve parameters }

F16K 37/0091 . . { by measuring fluid parameters }

### **F16K 39/00 Devices for relieving the pressure on the sealing faces**

F16K 39/02 . for lift valves

F16K 39/022 . . { using balancing surfaces }

F16K 39/024 . . { using an auxiliary valve on the main valve }

F16K 39/026 . . { using an external auxiliary valve }

F16K 39/028 . . { with pivoted closure members, e.g. butterfly valves }

F16K 39/04 . for sliding valves

F16K 39/045 . . { of rotating or pivoting type }

#### **WARNING**

Not yet complete, see [F16K 39/04](#) ]

F16K 39/06 . for taps or cocks



**F16K 41/00****Spindle sealings**

F16K 41/003

- . { by fluid }

F16K 41/006

- . { by establishing an under-pressure }

F16K 41/02

- . with stuffing-box; { Sealing rings }

F16K 41/023

- .. { for spindles which only rotate, i.e. non-rising spindles ( [F16K 41/043](#) , [F16K 41/063](#) and [F16K 41/083](#) take precedence ) }

F16K 41/026

- ... { for rotating valves }

F16K 41/04

- .. with at least one ring of rubber or like material between spindle and housing

F16K 41/043

- ... { for spindles which only rotate, i.e. non-rising spindles }

F16K 41/046

- .... { for rotating valves }

F16K 41/06

- .. with at least one ring attached to both spindle and housing

F16K 41/063

- ... { for spindles which only rotate, i.e. non-rising spindles }

**WARNING**

Not yet complete, see also [F16K 41/06](#) ]

F16K 41/066

- .... { for rotating valves }

**WARNING**

Not yet complete, see also [F16K 41/06](#) ]

F16K 41/08

- .. with at least one ring provided with axially-protruding peripheral closing-lip

F16K 41/083

- ... { for spindles which only rotate, i.e. non-rising spindles }

**WARNING**

Not yet complete, see also [F16K 41/08](#) ]

F16K 41/086

- .... { for rotating valves }

**WARNING**

Not yet complete, see also [F16K 41/08](#) ]

F16K 41/10

- . with diaphragm, e.g. shaped as bellows or tube

F16K 41/103

- .. { the diaphragm and the closure member being integrated in one member }

F16K 41/106

- .. { for use with rotating spindles or valves ( [F16K 41/125](#) takes precedence ) }

F16K 41/12

- .. with approximately flat diaphragm

F16K 41/125

- ... { the part of the spindle traversing the diaphragm being rotatable or pivotable }

F16K 41/14

- . with conical flange on the spindle which co-operates with a conical surface in the housing

F16K 41/16

- . with a flange on the spindle which rests on a sealing ring

- F16K 41/18 . . sealing only when the closure member is in the opened position
- F16K 43/00** **Auxiliary closure means in valves, which in case of repair, e.g. rewashing, of the valve, can take over the function of the normal closure means ; Devices for temporary replacement of parts of valves for the same purpose**
- F16K 43/001 . { an auxiliary valve being actuated independently of the main valve }
- F16K 43/003 . . { the auxiliary valve being a rotary valve }
- F16K 43/005 . { an auxiliary valve closing automatically when the main valve is being disassembled }
- F16K 43/006 . . { the auxiliary valve being held open by the main valve }
- F16K 43/008 . { the main valve having a back-seat position, e.g. to service the spindle sealing }
- F16K 47/00** **Means in valves for absorbing fluid energy { e.g. cushioning of opening or closure movement, eliminating of vibrations of the valve member } ( for pipes [F16L 55/00](#) )**
- F16K 47/02 . for preventing water-hammer or noise { e.g. for sanitary applications, toilet flush reservoirs ( [F16K 47/04](#) and [F16K 47/08](#) take precedence ) }
- F16K 47/023 . . { for preventing water-hammer, e.g. damping of the valve movement }
- F16K 47/026 . . { preventing noise in a single handle mixing valve }
- F16K 47/04 . for decreasing pressure { or noise level } , the throttle being incorporated in the closure member
- F16K 47/045 . . { and the closure member being rotatable }
- F16K 47/06 . . with a throttle in the form of a helical channel
- F16K 47/08 . for decreasing pressure { or noise level } and having a throttling member separate from the closure member, { e.g. screens, slots, labyrinths }
- F16K 47/10 . . in which the medium in one direction must flow through the throttling channel, and in the other direction may flow through a much wider channel parallel to the throttling channel
- F16K 47/12 . . the throttling channel being of helical form
- F16K 47/14 . . the throttling member being a perforated membrane
- F16K 47/16 . . the throttling member being a cone
- F16K 49/00** **Means in or on valves for heating or cooling ( for pipes [F16L 53/00](#) ; thermal insulation in connection with pipes or pipe systems [F16L 59/16](#) )**
- F16K 49/002 . { Electric heating means }
- F16K 49/005 . { Circulation means for a separate heat transfer fluid }
- F16K 49/007 . . { located within the obturating element }
- F16K 51/00** **Other details not peculiar to particular types of valves or cut-off apparatus**
- F16K 51/02 . specially adapted for high-vacuum installations

**F16K 99/00****Subject matter not provided for in other groups of this subclass**

- F16K 99/0001 . { Micro-valves ( micro-devices [B81B 1/00](#) ; manufacture or treatment of devices or systems in or on a substrate [B81C 1/00](#) ; micro-fluidic structures [B01L 3/5027](#) ; micro-pumps [F04B 19/006](#) ) }
- F16K 99/0003 .. { Constructional types of microvalves; Details of the cutting-off member }
- F16K 99/0005 ... { Lift valves }
- F16K 99/0007 .... { of cantilever type }
- F16K 99/0009 .... { the valve element held by multiple arms }
- F16K 99/0011 ... { Gate valves or sliding valves }
- F16K 99/0013 ... { Rotary valves }
- F16K 99/0015 ... { Diaphragm or membrane valves }
- F16K 99/0017 ... { Capillary or surface tension valves, e.g. using electro-wetting or electro-capillarity effects }
- F16K 99/0019 ... { Valves using a micro-droplet or micro-bubble as the valve member }
- F16K 99/0021 ... { No-moving-parts valves }
- F16K 99/0023 ... { with ball-shaped valve members }
- F16K 99/0025 ... { Valves using microporous membranes }
- F16K 99/0026 ... { Valves using channel deformation }
- F16K 99/0028 ... { Valves having multiple inlets or outlets }
- F16K 99/003 ... { Valves for single use only }
- F16K 99/0032 ... { using phase transition or influencing viscosity }
- F16K 99/0034 .. { Operating means specially adapted for microvalves }
- F16K 99/0036 ... { operated by temperature variations }
- F16K 99/0038 .... { using shape memory alloys }
- F16K 99/004 .... { using radiation }
- F16K 99/0042 ... { Electric operating means therefor }
- F16K 99/0044 .... { using thermo-electric means }
- F16K 99/0046 .... { using magnets }
- F16K 99/0048 .... { using piezoelectric means }
- F16K 99/0049 .... { using an electroactive polymer (EAP) }
- F16K 99/0051 .... { using electrostatic means }
- F16K 99/0053 .... { using magnetostrictive means }
- F16K 99/0055 ... { actuated by fluids }
- F16K 99/0057 .... { the fluid being the circulating fluid itself, e.g. check valves }
- F16K 99/0059 .... { actuated by a pilot fluid }
- F16K 99/0061 .... { actuated by an expanding gas or liquid volume }
- F16K 99/0063 ... { using centrifugal forces }
- F16K 99/0065 ... { using chemical activation }
- F16K 99/0067 .... { actuated by a pyrotechnical charge }
- F16K 2099/0069 .. Bistable microvalves
- F16K 2099/0071 .. with latching means

- F16K 2099/0073 . Fabrication methods specifically adapted for microvalves
- F16K 2099/0074 . . using photolithography, e.g. etching
- F16K 2099/0076 . . using electrical discharge machining (EDM), milling or drilling
- F16K 2099/0078 . . using moulding or stamping
- F16K 2099/008 . . Multi-layer fabrications
  
- F16K 2099/0082 . Microvalves adapted for a particular use
- F16K 2099/0084 . . Chemistry or biology, e.g. "lab-on-a-chip" technology
- F16K 2099/0086 . . Medical applications
- F16K 2099/0088 . . . Implanted devices
- F16K 2099/009 . . Fluid power devices
- F16K 2099/0092 . . Inkjet printers
- F16K 2099/0094 . . Micro-pumps
- F16K 2099/0096 . . Fuel injection devices
- F16K 2099/0098 . . Refrigeration circuits, e.g. for cooling integrated circuits