

**F 04 C ROTARY-PISTON, OR OSCILLATING-PISTON, POSITIVE-DISPLACEMENT MACHINES FOR LIQUIDS** (engines **F 03 C**); **ROTARY-PISTON, OR OSCILLATING-PISTON, POSITIVE-DISPLACEMENT PUMPS**

**Note**

Attention is drawn to the Notes preceding class **F 01**, especially as regards the definitions of “machines”, “pumps”, “positive displacement”, “rotary-piston machines”, “oscillating-piston machines”, “rotary piston”, “co-operating members”, “movement of co-operating members”, “teeth or tooth-equivalents”, and “internal axis”.

**Subclass Index**

**MACHINES OR PUMPS**

Rotary-piston	
general characteristics; non-parallel axes of movement of co-operating members .....	2/00; 3/00
resiliently-deformable chamber walls; fluid ring.....	5/00; 7/00
Oscillating-piston .....	9/00
Combinations or adaptations .....	11/00, 13/00
Other details or accessories .....	15/00

Pump installations..... 11/00

**PUMPS SPECIALLY ADAPTED FOR ELASTIC FLUIDS**

Rotary-piston: General characteristics; fluid ring; sealing arrangements.....	18/00; 19/00; 27/00
Oscillating-piston.....	21/00
Combinations; adaptations .....	23/00; 25/00
Other details or accessories.....	29/00
Pump installations.....	23/00

**Rotary-piston, or oscillating-piston, positive-displacement machines or pumps for liquids; Rotary-piston, or oscillating-piston, positive-displacement pumps**

- 2/00 Rotary-piston machines or pumps** (with non-parallel axes of co-operating members **3/00**; with the working-chamber walls at least partly resiliently deformable **5/00**; with fluid ring or the like **7/00**; rotary-piston machines or pumps in which the working-fluid is exclusively displaced by, or exclusively displaces, one or more reciprocating pistons **F 04 B**) [**3**]

**Note**

Group **2/30** takes precedence over groups **2/02** to **2/28**. [**3**]

- 2/02** . . . of arcuate-engagement type, i.e. with circular translatory movement of co-operating members, each member having the same number of teeth or tooth-equivalents [**3**]
- 2/04** . . . of internal-axis type [**3**]
- 2/06** . . . of other than internal-axis type (**2/063** takes precedence) [**3**]
- 2/063** . . . with coaxially-mounted members having continuously-changing circumferential spacing between them [**3**]
- 2/067** . . . . having cam-and-follower type drive [**3**]
- 2/07** . . . . having crankshaft-and-connecting-rod type drive [**3**]
- 2/073** . . . . having pawl-and-ratchet type drive [**3**]
- 2/077** . . . . having toothed-gearing type drive [**3**]
- 2/08** . . . of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [**3**]
- 2/10** . . . of internal-axis type with the outer member having more teeth or tooth-equivalents, e.g. rollers, than the inner member [**3**]
- 2/107** . . . . with helical teeth [**3**]
- 2/113** . . . . the inner member carrying rollers intermeshing with the outer member [**3**]
- 2/12** . . . of other than internal-axis type [**3**]

- 2/14** . . . . with toothed rotary pistons [**3**]
- 2/16** . . . . with helical teeth, e.g. chevron-shaped, screw type [**3**]
- 2/18** . . . . with similar tooth forms (**2/16** takes precedence) [**3**]
- 2/20** . . . . with dissimilar tooth forms (**2/16** takes precedence) [**3**]
- 2/22** . . . of internal-axis type with equidirectional movement of co-operating members at the points of engagement, or with one of the co-operating members being stationary, the inner member having more teeth or tooth-equivalents than the outer member [**3**]
- 2/24** . . . of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions [**3**]
- 2/26** . . . of internal-axis type [**3**]
- 2/28** . . . of other than internal-axis type [**3**]
- 2/30** . . . having the characteristics covered by two or more of groups **2/02**, **2/08**, **2/22**, **2/24** or having the characteristics covered by one of these groups together with some other type of movement between co-operating members [**3**]
- 2/32** . . . having both the movement defined in group **2/02** and relative reciprocation between the co-operating members [**3**]
- 2/324** . . . . with vanes hinged to the inner member and reciprocating with respect to the outer member [**3**]
- 2/328** . . . . and hinged to the outer member [**3**]
- 2/332** . . . . with vanes hinged to the outer member and reciprocating with respect to the inner member [**3**]
- 2/336** . . . . and hinged to the inner member [**3**]
- 2/34** . . . having the movement defined in group **2/08** or **2/22** and relative reciprocation between the co-operating members [**3**]
- 2/344** . . . . with vanes reciprocating with respect to the inner member [**3**]
- 2/348** . . . . the vanes positively engaging, with circumferential play, an outer rotatable member [**3**]

- 2/352 . . . . the vanes being pivoted on the axis of the outer member [3]
- 2/356 . . . . with vanes reciprocating with respect to the outer member [3]
- 2/36 . . . . having both the movements defined in groups 2/22 and 2/24 [3]
- 2/38 . . . . having the movement defined in group 2/02 and having a hinged member (2/32 takes precedence) [3]
- 2/39 . . . . with vanes hinged to the inner as well as to the outer member [3]
- 2/40 . . . . having the movement defined in group 2/08 or 2/22 and having a hinged member [3]
- 2/44 . . . . with vanes hinged to the inner member [3]
- 2/46 . . . . with vanes hinged to the outer member [3]
- 3/00 Rotary-piston machines or pumps, with non-parallel axes of movement of co-operating members, e.g. of screw type (with the working-chamber walls at least partly resiliently deformable 5/00)**
- 3/02 . . . . the axes being arranged at an angle of 90 degrees [5]
- 3/04 . . . . of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [5]
- 3/06 . . . . the axes being arranged otherwise than at an angle of 90 degrees [5]
- 3/08 . . . . of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [5]
- 5/00 Rotary-piston machines or pumps with the working-chamber walls at least partly resiliently deformable**
- 7/00 Rotary-piston machines or pumps with fluid ring or the like**
- 9/00 Oscillating-piston machines or pumps**
- 11/00 Combinations of two or more machines or pumps, each being of rotary-piston or oscillating-piston type; Pumping installations (13/00 takes precedence; fluid gearing F 16 H)**
- 13/00 Adaptations of machines or pumps for special use, e.g. for extremely high pressures**
- 15/00 Component parts, details, or accessories, of machines, pumps, or pumping installations, not provided for in, or of interest apart from, other groups**
- 15/02 . . . . Control of working-fluid admission or discharge
- 15/04 . . . . Other regulation or control

**Rotary-piston, or oscillating-piston, positive-displacement pumps specially adapted for elastic fluids**

- 18/00 Rotary-piston pumps (with fluid ring or the like 19/00; rotary-piston pumps in which the working-fluid is exclusively displaced by one or more reciprocating pistons F 04 B) [3]**

**Note**

- Group 18/30 takes precedence over groups 18/02 to 18/28 and 18/48 to 18/56. [3,5]
- 18/02 . . . . of arcuate-engagement type, i.e. with circular translatory movement of co-operating members, each member having the same number of teeth or tooth-equivalents [3]
- 18/04 . . . . of internal-axis type [3]
- 18/06 . . . . of other than internal-axis type (18/063 takes precedence) [3]
- 18/063 . . . . with coaxially-mounted members having continuously-changing circumferential spacing between them [3]
- 18/067 . . . . having cam-and-follower type drive [3]
- 18/07 . . . . having crankshaft-and-connecting-rod type drive [3]
- 18/073 . . . . having pawl-and-ratchet type drive [3]
- 18/077 . . . . having toothed-gearing type drive [3]
- 18/08 . . . . of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [3]
- 18/10 . . . . of internal-axis type with the outer member having more teeth or tooth-equivalents, e.g. rollers, than the inner member [3]
- 18/107 . . . . with helical teeth [3]
- 18/113 . . . . the inner member carrying rollers intermeshing with the outer member [3]
- 18/12 . . . . of other than internal-axis type [3]
- 18/14 . . . . with toothed rotary pistons [3]
- 18/16 . . . . with helical teeth, e.g. chevron-shaped, screw type [3]
- 18/18 . . . . with similar tooth forms (18/16 takes precedence) [3]
- 18/20 . . . . with dissimilar tooth forms (18/16 takes precedence) [3]
- 18/22 . . . . of internal-axis type with equidirectional movement of co-operating members at the points of engagement, or with one of the co-operating members being stationary, the inner member having more teeth or tooth-equivalents than the outer member [3]
- 18/24 . . . . of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions [3]
- 18/26 . . . . of internal-axis type [3]
- 18/28 . . . . of other than internal-axis type [3]
- 18/30 . . . . having the characteristics covered by two or more of groups 18/02, 18/08, 18/22, 18/24, 18/48, or having the characteristics covered by one of these groups together with some other type of movement between co-operating members [3]
- 18/32 . . . . having both the movement defined in group 18/02 and relative reciprocation between the co-operating members [3]
- 18/324 . . . . with vanes hinged to the inner member and reciprocating with respect to the outer member [3]
- 18/328 . . . . and hinged to the outer member [3]
- 18/332 . . . . with vanes hinged to the outer member and reciprocating with respect to the inner member [3]
- 18/336 . . . . and hinged to the inner member [3]
- 18/34 . . . . having the movement defined in group 18/08 or 18/22 and relative reciprocation between the co-operating members [3]

- 18/344 . . . with vanes reciprocating with respect to the inner member [3]
- 18/348 . . . . the vanes positively engaging, with circumferential play, an outer rotatable member [3]
- 18/352 . . . . the vanes being pivoted on the axis of the outer member [3]
- 18/356 . . . with vanes reciprocating with respect to the outer member [3]
- 18/36 . . having both the movements defined in groups 18/22 and 18/24 [3]
- 18/38 . . having the movement defined in group 18/02 and having a hinged member (18/32 takes precedence) [3]
- 18/39 . . . with vanes hinged to the inner as well as to the outer member [3]
- 18/40 . . having the movement defined in group 18/08 or 18/22 and having a hinged member [3]
- 18/44 . . . with vanes hinged to the inner member [3]
- 18/46 . . . with vanes hinged to the outer member [3]
- 18/48 . Rotary-piston pumps with non-parallel axes of movement of co-operating members [5]
- 18/50 . . the axes being arranged at an angle of 90 degrees [5]
- 18/52 . . . of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [5]
- 18/54 . . the axes being arranged otherwise than at an angle of 90 degrees [5]
- 18/56 . . . of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing [5]
- 19/00 Rotary-piston pumps with fluid ring or the like**
- 21/00 Oscillating-piston pumps**
- 23/00 Combinations of two or more pumps, each being of rotary-piston or oscillating-piston type; Pumping installations; Multi-stage pumps (25/00 takes precedence)**
- 23/02 . Pumps characterised by combination with, or adaptation to, specific driving engines or motors (predominant aspects of the engines or motors, see the relevant classes)
- 25/00 Adaptations of pumps for special use**
- 25/02 . for producing high vacuum (sealing arrangements 27/00; silencing 29/06)
- 27/00 Sealing arrangements in rotary-piston pumps (sealing in general F 16 J)**
- 27/02 . Liquid sealing for high-vacuum pumps
- 29/00 Component parts, details, or accessories, of pumps or pumping installations, not provided for in, or of interest apart from, groups 18/00 to 27/00**
- 29/02 . Lubrication (of machines or engines in general F 01 M); Lubricant separation (separation in general B 01 D)
- 29/04 . Heating; Cooling (of machines or engines in general F 01 P); Heat insulation (heat insulation in general F 16 L 59/00)
- 29/06 . Silencing (gas-flow silencers or exhaust apparatus for machines or engines in general F 01 N)
- 29/08 . Control of working-fluid admission or discharge
- 29/10 . Other regulation or control