

ECLA EUROPEAN CLASSIFICATION

F02P

IGNITION, OTHER THAN COMPRESSION IGNITION, FOR INTERNAL-COMBUSTION ENGINES; TESTING OF IGNITION TIMING IN COMPRESSION-IGNITION ENGINES ([N: anti-pollution means for internal-combustion engines [F02B17/00](#)]; specially adapted for rotary-piston or oscillating-piston engines [F02B 53/12](#); [N: ignition of gas turbine plants [F02C7/26](#); ignition of jet propulsion plants [F02K9/95](#); starting of combustion engines [F02N9/00](#)]; ignition of combustion apparatus in general, glowing plugs [F23Q](#); measuring of physical variables in general [G01](#); controlling in general [G05](#); data processing in general [G06](#); electrical components in general see Section H; [N: ignition coils [H01F38/12](#)]; sparking plugs [H01T13/00](#)] [C9604]

Guide heading: Electric spark ignition installations characterised by the type of ignition power generation or storage

F02P1/00 Installations having electric ignition energy generated by magneto- or dynamo-electric generators without subsequent storage [N: (combination starter-magneto [F02N11/06](#); magneto- or dynamo-electric generators [H02K21/00](#))] [C9604]

F02P1/00B . [N: Construction and fastening of elements of magnetos other than the magnetic circuit and the windings ([F02P1/02](#) to [F02P1/08](#) take precedence)] [N9604]

F02P1/02 . the generator rotor being characterised by forming part of the engine flywheel

F02P1/04 . the generator being specially adapted for use with specific engine types, e.g. engines with V arrangement of cylinders

F02P1/06 . Generator drives, e.g. having snap couplings

F02P1/08 . Layout of circuits

F02P1/08B . . [N: for generating sparks by opening or closing a coil circuit]

F02P1/08C . . [N: for generating sparks by discharging a capacitor into a coil circuit]

F02P3/00 **Other installations**

F02P3/00B . [N: having inductive-capacitance energy storage (capacitive storage installations using an intermediate charging inductance [F02P3/08H](#))]

F02P3/01 . Electric spark ignition installations without subsequent energy storage, i.e. energy supplied by an electrical oscillator (with magneto- or dynamo-electric generators [F02P1/00](#); piezo-electric ignition [F02P3/12](#); with continuous electric spark [F02P15/10](#)) [N9604]

F02P3/02 . having inductive energy storage, e.g. arrangements of induction coils [N: (ignition coils structurally combined with sparking plugs [F02P13/00](#); constructional details of ignition coils [H01F38/12](#))] [C9604]

F02P3/04 . . Layout of circuits

- F02P3/04D [N: Opening or closing the primary coil circuit with electronic switching means ([F02P3/045](#) to [F02P3/055](#) take precedence)] [N9604]
- F02P3/04D2 [N: using digital techniques ([F02P3/04D4B](#), [F02P3/04D6B](#) take precedence)] [N9604]
- F02P3/04D4 [N: with electronic tubes] [N9604]
- F02P3/04D4B [N: using digital techniques] [N9604]
- F02P3/04D6 [N: with semiconductor devices ([F02P3/045B](#), [F02P3/05B](#), [F02P3/055B](#) take precedence)] [N9604]
- F02P3/04D6B [N: using digital techniques ([F02P3/045B2](#), [F02P3/05B2](#), [F02P3/055B2](#), [F02P3/055B4B](#) take precedence)] [N9604]
- F02P3/045 for control of the dwell or anti dwell time [N9604]
- F02P3/045B [N: Opening or closing the primary coil circuit with semiconductor devices] [N9604]
- F02P3/045B2 [N: using digital techniques] [N9604]
- F02P3/05 for control of the magnitude of the current in the ignition coil (during starting [F02P15/12](#)) [N9604]
- F02P3/05B [N: Opening or closing the primary coil circuit with semiconductor devices] [N9604]
- F02P3/05B2 [N: using digital techniques] [N9604]
- F02P3/055 with protective means to prevent damage to the circuit, [N: e.g. semiconductor devices] or the ignition coil [N9604]
- F02P3/055B [N: Opening or closing the primary coil circuit with semiconductor devices] [N9604]
- F02P3/055B2 [N: using digital techniques ([F02P3/055B4B](#) takes precedence)] [N9604]
- F02P3/055B4 [N: Protecting the coil when the engine is stopped] [N9604]
- F02P3/055B4B [N: using digital techniques] [N9604]

- F02P3/06 having capacitive energy storage (piezo-electric or electrostatic ignition [F02P3/12](#))
- F02P3/08 Layout of circuits (for low tension [F02P3/10](#))
- F02P3/08D [N: Closing the discharge circuit of the storage capacitor with electronic switching means ([F02P3/08F](#), [F02P3/08H](#), [F02P3/09](#) take precedence)] [N9604]
- F02P3/08D2 [N: using digital techniques ([F02P3/08D4B](#), [F02P3/08D6B](#) take precedence)] [N9604]
- F02P3/08D4 [N: with electronic tubes] [N9604]
- F02P3/08D4B [N: using digital techniques] [N9604]
- F02P3/08D6 [N: with semiconductor devices ([F02P3/08F2](#), [F02P3/08H2](#), [F02P3/09B](#) take precedence)] [N9604]
- F02P3/08D6B [N: using digital techniques ([F02P3/08F2B](#), [F02P3/08H2B](#), [F02P3/09B2](#) take precedence)] [N9604]
- F02P3/08F [N: for control of the dwell or anti-dwell time] [N9604]
- F02P3/08F2 [N: Closing the discharge circuit of the storage capacitor with semiconductor devices] [N9604]
- F02P3/08F2B [N: using digital techniques] [N9604]
- F02P3/08H [N: the storage capacitor being charged by means of an energy converter (DC-DC converter) or of an intermediate storage inductance] [N9604]
- F02P3/08H2 [N: Closing the discharge circuit of the storage capacitor with semiconductor devices] [N9604]

- F02P3/08H2B [N: using digital techniques] [N9604]
- F02P3/09 for control of the charging current in the capacitor ([F02P15/12](#) takes precedence) [N9604]
- F02P3/09B [N: Closing the discharge circuit of the storage capacitor with semiconductor devices] [N9604]
- F02P3/09B2 [N: using digital techniques] [N9604]
- F02P3/10 Low-tension installation, e.g. using surface-discharge sparking plugs
- F02P3/12 Piezo-electric ignition; Electrostatic ignition

Guide heading: **Advancing or retarding electric ignition spark; Arrangements of distributors or of circuit-makers or -breakers for electric spark ignition; Electric spark ignition control or safety means, not otherwise provided for**

F02P5/00 Advancing or retarding ignition; Control therefor

- F02P5/00A [N: with combination of automatic and non- automatic means]
- F02P5/02 non-automatically; dependent on position of personal controls of engine, e.g. throttle position [C9604]
- F02P5/04 automatically, as a function of the working conditions of the engine or vehicle or of the atmospheric conditions (dependent on position of personal controls of engine [F02P5/02](#)) [C9604]
- F02P5/04C [N: combined with electronic control of other engine functions, e.g. fuel injection (in general [F02D37/02](#))]
- F02P5/05 using mechanical means [N9604]
- F02P5/06 dependent on engine speed [N9604]
- F02P5/07 Centrifugal timing mechanisms [N9604]
- F02P5/07B [N: Centrifugal devices combined with other specific conditions] [N9604]
- F02P5/10 dependent on fluid pressure in engine, e.g. combustion-air pressure [N9604]
- F02P5/10B [N: dependent on the combustion-air pressure in engine] [N9604]
- F02P5/10B2 [N: Combustion-air pressure devices combined with other specific conditions (with centrifugal devices [F02P5/07B](#))] [N9604]
- F02P5/12 dependent a specific pressure other than that of combustion-air, e.g. of exhaust, cooling fluid, lubricant [N9604]
- F02P5/14 dependent on specific conditions other than engine speed or engine fluid pressure, e.g. temperature [N9604]
- F02P5/14B [N: dependent on a combination of several specific conditions ([F02P5/07B](#), [F02P5/10B2](#) takes precedence)] [N9604]
- F02P5/145 using electrical means [N9604]
- F02P5/145B [N: by using a second control of the closed loop type (dependent on pinking [F02P5/152](#))] [N9604]
- F02P5/15 digital data processing [N9604]
- F02P5/15B [N: using one central computing unit] [N9604]
- F02P5/15B2 [N: with particular means during a transient phase, e.g. acceleration, deceleration, gear change (during starting [F02P5/15B4](#))] [N9604]

- F02P5/15B4 [N: with particular means during starting] [N9604]
- F02P5/15B6 [N: with particular means during idling] [N9604]
- F02P5/15B8 [N: with means for compensating the variation of the characteristics of the engine or of a sensor, e.g. by ageing] [N9604]
- F02P5/15B10 [N: with particular means concerning an individual cylinder] [N9604]
- F02P5/15B12 [N: with means for optimising the use of registers or of memories, e.g. interpolation] [N9604]
- F02P5/15B14 [N: with means relating to exhaust gas recirculation, e.g. turbo] [N9604]
- F02P5/15D [N: using two or more central computing units, e.g. interpolation] [N9604]
- F02P5/152 dependent on pinking (detecting or indicating knocks in internal-combustion engines [G01L23/22](#)) [N9604]
- F02P5/152B [N: with particular means during a transient phase, e.g. starting, acceleration, deceleration, gear change] [N9604]
- F02P5/152D [N: with particular means concerning an individual cylinder] [N9604]
- F02P5/152F [N: with particular laws of return to advance, e.g. step by step, differing from the laws of retard] [N9604]
- F02P5/152H [N: with means for compensating the variation of the characteristics of the pinking sensor or of the electrical means, e.g. by ageing (when variation of characteristics results only from incorrect functioning [F02P5/152J](#))] [N9604]
- F02P5/152J [N: with means for taking into account incorrect functioning of the pinking sensor or of the electrical means] [N9604]
- F02P5/152L [N: with means allowing burning of two or more fuels, e.g. super or normal, premium or regular] [N9604]
- F02P5/152N [N: for turbocompressed engine] [N9604]
- F02P5/153 dependent on combustion pressure [N9604]
- F02P5/155 Analogue data processing [N9604]
- F02P5/155B [N: by determination of elapsed time with reference to a particular point on the motor axle, dependent on specific conditions] [N9604]
- F02P5/155D [N: by determination of elapsed angle with reference to a particular point on the motor axle, dependent on specific conditions] [N9604]
- F02P5/155D2 [N: using a continuous control, dependent on speed] [N9604]
- F02P5/155D4 [N: using a stepped control, dependent on speed] [N9604]
- F02P5/155F [N: with special measures for starting] [N9604]

- F02P5/16 characterised by the mechanical transmission between sensing elements or personal controls and final actuating elements [N9604]

F02P7/00

Arrangements of distributors, circuit-makers or -breakers, [N: e.g. of distributor and circuit-breaker combinations] or **pick-up devices** (advancing or retarding ignition or control therefor [F02P5/00](#); such devices *per se*, see the relevant classes of Section H, e.g. rotary switches [H01H19/00](#), contact-breakers, distributors [H01R39/00](#), generators [H02K](#))

- F02P7/02 of distributors
- F02P7/02A [N: Mechanical distributors]
- F02P7/02A1 [N: Details of the distributor rotor or electrode]
- F02P7/02A2 [N: with magnetically controlled mechanical contacts]

- F02P7/02A3 . . . [N: with noise suppression means specially adapted for the distributor]
- F02P7/02A4 . . . [N: Distributors combined with other ignition devices, e.g. coils, fuel-injectors]
- F02P7/02A4A [N: combined with centrifugal advance devices]
- F02P7/02A4B [N: combined with circuit-makers or -breakers (and with centrifugal advance devices [F02P7/02A4A](#))]
- F02P7/03 . . with electrical means (ignition occurring simultaneously at different places in one engine cylinder or in two or more separate engine cylinders [F02P15/08](#)) [N9604]
- F02P7/03B . . . [N: without mechanical switching means] [N9604]
- F02P7/04 . . having distributors with air-tight casing [C9604]
- F02P7/06 . of circuit-makers or -breakers, or pick-up devices adapted to sense particular points of the timing cycle
- F02P7/06B . . [N: pick-up devices without mechanical contacts ([F02P7/067](#) to [F02P7/077](#) take precedence)] [C9604]
- F02P7/063 . . Mechanical pick-up devices, circuit-makers or -breakers, e.g. contact-breakers [N9604]
- F02P7/063B . . . [N: Constructional details of contacts] [N9604]
- F02P7/063D . . . [N: with rotary contacts] [N9604]
- F02P7/063F . . . [N: Details of cams or cam-followers] [N9604]
- F02P7/063H . . . [N: with means to set the breaker gap] [N9604]
- F02P7/063J . . . [N: with several circuit-makers or -breakers actuated by the same cam] [N9604]
- F02P7/063L . . . [N: with noise suppression means specially adapted for the breakers] [N9604]
- F02P7/067 . . Electromagnetic pick-up devices, [N: e.g. providing induced current in a coil] [N9604]
- F02P7/067B . . . [N: using Wiegand effect] [N9604]
- F02P7/067D . . . [N: with variable reluctance, e.g. depending on the shape of a tooth] [N9604]
- F02P7/067F . . . [N: Mechanical arrangements] [N9604]
- F02P7/07 . . . Hall-effect pick-up devices [N9604]
- F02P7/073 . . Optical pick-up devices [N9604]
- F02P7/077 . . Circuits therefor, e.g. pulse generators [N9604]
- F02P7/077B . . . [N: Electronical verniers] [N9604]
- F02P7/08 . . having air-tight casings
- F02P7/10 . Drives of distributors or of circuit-makers or -breakers

F02P9/00 Electric spark ignition control, not otherwise provided for

- F02P9/00A . [N: Control of spark intensity, intensifying, lengthening, suppression (by means of current control in the storage devices [F02P3/05](#), [F02P3/09](#), during starting [F02P15/12](#))]
- F02P9/00A1 . . [N: by weakening or suppression of sparks to limit the engine speed]
- F02P9/00A3 . . [N: by supplementary electrical discharge in the pre-ionised electrode interspace of the sparking plug, e.g. plasma jet ignition]

F02P11/00 Safety means for electric spark ignition, not otherwise provided for

- F02P11/02 . Preventing damage to engines or engine-driven gearing
- F02P11/02A . . [N: Shortening the ignition when the engine is stopped (to prevent damage to the coil [F02P3/055B4](#))]
- F02P11/04 . Preventing unauthorised use of engines (of vehicles [B60R25/04](#); ignition locks [H01H27/00](#))
- F02P11/06 . Indicating unsafe conditions

- F02P13/00** **Sparking plugs structurally combined with other parts of internal-combustion engines** ([N: connection of ignition coil to spark plug connector [F02P3/02](#)]; with fuel injectors [F02M57/06](#); [N: spark plug connectors per se [H01T13/04](#) to [H01T13/06](#); predominant aspects of sparking plug, see [H01T13/40](#) to [H01T13/44](#)]; predominant aspects of the parts, see the relevant subclasses) [C9604]

- F02P15/00** **Electric spark ignition having characteristics not provided for in, or of interest apart from, groups [F02P1/00](#) to [F02P13/00](#)** [N: and combined with layout of ignition circuits (not combined [F02B](#), [F02C](#), [F02G](#), [F02K](#))]
- F02P15/00A . [N: Ignition installations adapted to specific engine types (ignition of jet propulsion plants [F02K9/95](#); for rotary piston engines [F02B53/12](#))]
- F02P15/00A1 . . [N: Layout of ignition circuits for gas turbine plants (ignition of gas turbine plants per se [F02C 7/26](#))]
- F02P15/00A2 . . [N: Layout of ignition circuits for rotary- or oscillating piston engines (ignition of those engines per se [F02B 53/12](#))]
- F02P15/00B . [N: Ignition installations combined with other systems, e.g. fuel injection (to advance or to retard the ignition spark [F02P5/04C](#))]
- F02P15/00C . [N: Reserve ignition systems; Redundancy of some ignition devices]
- F02P15/02 . Arrangements having two or more sparking plugs
- F02P15/04 . one of the spark electrodes being mounted on the engine working piston
- F02P15/06 . the electric spark triggered by engine working cylinder compression
- F02P15/08 . having multiple-spark ignition, i.e. ignition occurring simultaneously at different places in one engine cylinder or in two or more separate engine cylinders
- F02P15/10 . having continuous electric sparks
- F02P15/12 . having means for strengthening spark during starting

- F02P17/00** **Testing of ignition installations, e.g. in combination with adjusting (testing fuel injection apparatus [F02M65/00](#); testing ignition installations in general [F23Q23/00](#)); Testing of ignition timing in compression-ignition engines**
- F02P17/02 . Checking or adjusting ignition timing [N9509]
- F02P17/04 . . dynamically [N9509]

- F02P17/06 . . . using a stroboscopic lamp [N9509]
- F02P17/08 . . . using a cathode-ray oscilloscope (17/06 takes precedence) [N9509]
- F02P17/10 . Measuring dwell or antidwell time [N9509]
- F02P17/12 . Testing characteristics of the spark, ignition voltage or current (testing of sparking plugs [H01T13/60](#)) [N9509] [C9604]

Guide heading: **Other ignition**

F02P19/00 **Incandescent ignition, e.g. during starting of internal combustion engines; Combination of incandescent and spark ignition [C9604]**

- F02P19/02 . electric, e.g. layout of circuits of apparatus having glowing plugs
- F02P19/02B . . [N: characterised by power delivery controls] [N1204]
- F02P19/02B2 . . . [N: using intermittent current supply] [N1204]
- F02P19/02B4 . . . [N: Individual control of the glow plugs] [N1204]
- F02P19/02D . . [N: with means for determining glow plug temperature or glow plug resistance] [N1204]
- F02P19/02F . . [N: Glow plug actuation during engine operation] [N1204]
- F02P19/02M . . [N: Safety devices, e.g. for diagnosing the glow plugs or the related circuits] [N1204]
- F02P19/02S . . [N: the glow plug being combined with or used as a sensor] [N1204]
- F02P19/04 . non-electric, e.g. heating incandescent spots by burners (use of burners for direct ignition [F02P21/00](#))

F02P21/00 **Direct use of flames or burners for ignition**

- F02P21/02 . the flames being kept burning essentially external to engine working chambers
- F02P21/04 . Burning-cartridges or like inserts being arranged in engine working chambers (as starting aid [F02N17/02](#))

F02P23/00 **Other ignition**

- F02P23/02 . Friction, pyrophoric, or catalytic ignition
- F02P23/04 . Other physical ignition means, e.g. using laser rays
- F02P23/04B . . [N: using electromagnetic microwaves]