

Claims

1. Portable, controllable and autonomous subsea weld inspection tool (100) for detachable attachment to a subsea structure (20), comprising an attachment assembly (110) formed by a body (111) provided with controllable clamps (112a-b) arranged at each side of the body (111) for detachable attachment to the subsea structure (20), and an inspection probe holder assembly (150), wherein the inspection probe holder assembly (150) is arranged movable in longitudinal direction of the attachment assembly (110), **characterized in** that the clamps (112a-b) are arranged for retaining the attachment assembly (110) to the subsea structure with a predetermined force and allowing the attachment assembly (110) with the inspection probe holder assembly (150) to be moved in circumferential direction of the subsea structure (20), wherein the inspection probe holder assembly (150) is formed by a main body (151) arranged movable in longitudinal direction of the attachment assembly (110) by means of at least one controllable shaft (152).
2. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 1, **characterized in** that inspection probe holder assembly (150) is provided with an inspection probe holder (160), controllably arranged to the far end of the main body (151) for arrangement of at least one inspection probe (170).
3. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 2, **characterized in** that the inspection probe holder assembly (150) is arranged for rotatable or pivotable movement of the inspection probe (170) arranged to the inspection probe holder assembly (150) about vertical axis of the inspection probe holder assembly (150) and thus the portable, controllable and autonomous subsea weld inspection tool (100).
4. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 3, **characterized in** that the inspection probe holder (160) is arranged to travel on a C-shaped track (161) by means of at least one carriage (162), the C-shaped track (161) extending in transversal direction of the main body (151), in a parallel horizontal plane thereof, driven by an electric motor (163) via transmission means.
5. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 2, **characterized in** that the inspection probe holder assembly (150) is arranged for tiltable movement of the inspection probe (170) arranged to the inspection probe holder assembly (150) in vertical

direction in relation to the longitudinal direction of the portable, controllable and autonomous subsea weld inspection tool (100).

6. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 5,
characterized in that the inspection probe holder (160) is arranged to the at least one carriage (162)
5 by a hinged connection at one side and wherein the other side is arranged to a manipulator arm
(164) connected to an electric motor (165).

7. Portable, controllable and autonomous subsea weld inspection tool (100) according to any one
of the preceding claims, **characterized in** that it is provided with at least one camera (180) and at
least one light source, wherein the at least one light sources are arranged for providing reference
10 points that can be optically read by the at least one cameras (180), and used for automated control
of the portable, controllable and autonomous subsea weld inspection tool (100) in relation to a weld
(10).

8. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 1,
characterized in that it comprises a control unit arranged to use sensors to collect data of the weld
15 shape, and recognizing or reading the shape in such manner that the movements can be
recognized or calculated by the portable, controllable and autonomous subsea weld inspection
tool (100).

9. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 1,
20 **characterized in** that the controllable clamps (112a-b) are provided with rolls or wheels (113) with
or without magnetics for peripheral movement and the body (111) is provided with rolls (114) at
contact surfaces of the body (111) with the subsea structure (20).

10. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 1,
25 **characterized in** that the controllable clamps (112a-b) are arranged to a controllable
synchronization stay (115) for ensuring centralization in relation to the subsea structure (20).

11. Portable, controllable and autonomous subsea weld inspection tool (100) according to claim 1,
characterized in that the controllable clamps (112a-b) are controllable by actuators and in
30 addition spring-loaded such that the clamps (112a-b) are retaining the attachment assembly (110)
to the subsea structure (20) with a predefined force.

12. Portable, controllable and autonomous subsea weld inspection tool (100) according any preceding claim, **characterized in** that it comprises a control unit that can recognize weld shape against already modelled or read shapes by machine learning and use this information to calculate the needed movement of the inspection probe holder assembly (150).