CLAIMS

1. A drilling system including a drill string which extends from a floating drilling rig to a well bore, and a tubular riser which surrounds at least part of the portion of the drill string between the well bore and drilling rig, the riser having a telescopic joint between a first tubular portion and a second tubular portion of the riser, the first tubular portion extending down to a well head at the top of the well bore and the second tubular portion extending up towards the drilling rig, the telescopic joint comprising an inner tube part which is mounted within an outer tube part, the drilling system further including a riser closure device which is mounted in the second tubular portion of the riser and which is operable to provide a substantially fluid tight seal between the riser and the drill string whilst permitting the drill string to rotate relative to the riser~~.~~, wherein the riser has a main bore along which the drill extends, and a side bore which extends from the main bore of the second portion of the riser between the telescopic joint and the riser closure device to the exterior of the riser, wherein the side bore is connected to a fluid flow line which extends from the side bore to a fluid reservoir, the fluid flow line being part of a flow control system, wherein the drilling system also includes a damper system which comprises a vessel which is divided into first and second substantially fluid tight chambers by means of a movable divider, the first chamber being connected to the fluid flow line and the second chamber being connected to a pressurised fluid reservoir.

2. A drilling system according to claim 1 wherein the riser closure device is a rotating control device.

~~3. A drilling system according to claim 1 or 2 wherein the riser has a main bore along which the drill string extends, and a side bore which extends from the main bore of the second portion of the riser between the telescopic joint and the riser closure device to the exterior of the riser~~.

~~4. A drilling system according to claim 3 wherein the side bore is connected to a fluid flow line which extends from the side bore to a fluid reservoir, the fluid flow line being part of a flow control system~~.

~~5~~3. A drilling system according to claim ~~4~~ 1 wherein the flow control system further includes a flow control device which is provided in the fluid flow line and which is operable to restrict the flow of fluid along the fluid flow line to a variable degree.

~~6~~4. A drilling system according to claim ~~5~~ 3 wherein the flow control device is controlled using an electronic control unit.

~~7~~5. A drilling system according to claim ~~6~~ 4 wherein the drilling system further includes a pressure sensor which transmits an electrical signal indicative of the fluid pressure in the fluid flow line to the electronic control unit.

~~8. A drilling system according to claim 4 wherein the drilling system also includes a damper system which comprises a vessel which is divided into first and second substantially fluid tight chambers by means of a movable divider, the first chamber being connected to the fluid flow line and the second chamber being connected to a pressurised fluid reservoir~~.

~~9~~6. A drilling system according to claim ~~8~~ 1 wherein the damper system further includes a pressure regulator device which is operable to control the pressure of fluid in the second chamber.

~~10~~7. A drilling system according to claim ~~6~~ 4 and claim ~~9~~ 6 wherein the pressure regulator device is controlled using the electronic control unit.

~~11~~8. A drilling system according to any preceding claim wherein the drilling system includes a displacement meter which provides a displacement signal indicative of the displacement of the first portion of the riser relative to the second portion of the riser.

~~12~~9. A drilling system according to claim ~~6 –~~4 and ~~11 –~~8 wherein the displacement meter is in communication with the electronic control unit so that it can transmit the displacement signal to the electronic control unit.

~~13~~10. A drilling system according to claim ~~4 –~~1 wherein the drilling system includes a flow meter which is located in the fluid flow line the flow meter providing a flow signal indicative of the rate of fluid flow along the fluid flow line.

~~14~~11. A drilling system according to claim ~~6 –~~4 and claim ~~13 –~~10 wherein the flow meter is in communication with the electronic control unit so that it can transmit the flow signal to the electronic control unit.

~~15~~12. A drilling system according to any preceding claim wherein the telescopic joint includes a seal which extends between the inner tube part and the outer tube part of the telescopic joint so as to provide a substantially fluid tight seal between the inner tube part and the outer tube part whilst permitting the inner tube part and outer tube part to slide relative to one another.

~~16~~13. A method of operating a drilling system according to claim 1~~, wherein the riser has a main bore along which the drill string extends, and a side bore which extends from the main bore of the second portion of the riser between the telescopic joint and the riser closure device to the exterior of the riser, the side bore being connected to a fluid flow line which extends from the side bore to a fluid reservoir, the fluid flow line being part of a flow control system which includes~~ the drilling system including a flow control device which is provided in the fluid flow line and which is operable to restrict the flow of fluid along the fluid flow line to a variable degree~~, the flow control system further including a damper system which comprises a vessel which is divided into first and second substantially fluid tight chambers by means of a movable divider such as a diaphragm or piston, the first chamber being connected to the fluid flow line and the second chamber being connected to a pressurised fluid reservoir~~, and a pressure regulator device which is operable to control the pressure of

fluid in the second chamber, the method including the steps of controlling operation of both the flow control device and the pressure regulator to maintain a substantially constant fluid pressure in the fluid flow line.

~~17~~14. A method of operating a drilling system according to claim 1~~ wherein the riser has a main bore along which the drill string extends, and a side bore which extends from the main bore of the second portion of the riser between the telescopic joint and the riser closure device to the exterior of the riser, the side bore being connected to a fluid flow line which extends from the side bore to a fluid reservoir, the fluid flow line being part of a flow control system~~, the flow control system including a flow meter which is located in the fluid flow line~~,~~ ~~preferably between the side bore and the flow control device~~, the flow meter providing a flow signal indicative of the rate of fluid flow along the fluid flow line, the ~~well~~ flow control system further including a displacement meter which provides a displacement signal indicative of the displacement of the first portion of the riser relative to the second portion of the riser, wherein the method includes the steps of using the displacement signal to calculate a change in volume of fluid in the riser over a particular period of time (δV), and using the flow signal and the calculated change in volume of fluid in the riser to produce an adjusted out flow rate, comparing the adjusted flow rate with the rate of flow of drilling fluid into the drill string (the in flow rate), and if the adjusted out flow rate differs from the in flow rate by more than a first predetermined amount raise an alarm signal to alert an operator of this, if the adjusted out flow rate exceeds the in flow rate by more than a second predetermined amount, operating the ~~well~~ flow control system to carry out a kick control procedure, and, if the adjusted out flow rate is less than the in flow rate by more than a third predetermined amount, operating the ~~well~~ flow control system to carry out an in flow control procedure.

~~18~~15. A method according to claim ~~17~~ 14 wherein δV is calculated using the formula:

$\delta V = \delta D.(A_{SJ}-A_{DS})$,

where δD is the change in displacement of the first portion of the riser relative to the second over the period of time,

A_{SJ} is the internal cross-sectional area of the inner tube section of the telescopic joint, and

A_{DS} is the external cross-sectional area of the drill string.

~~19~~16. A method according to claim ~~17~~ 14 wherein the adjusted out flow rate (Qout.adj) is calculated using the formula:

$$Qout.adj = Qout + \left(\frac{\sigma V}{\sigma T}\right)$$

where Qout is the measured volumetric out flow rate.

~~20~~17. A method of operating a drilling system according to claim 1, ~~wherein the riser has a main bore along which the drill string extends, and a side bore which extends from the main bore of the second portion of the riser between the telescopic joint and the riser closure device to the exterior of the riser, the side bore being connected to a fluid flow line which extends from the side bore to a fluid reservoir, the fluid flow line being part of a flow control system which includes~~the drilling system including a flow control device which is provided in the fluid flow line and which is operable to restrict the flow of fluid along the fluid flow line to a variable degree, the ~~well~~ flow control system further including a displacement meter which provides a displacement signal indicative of the displacement of the first portion of the riser relative to the second portion of the riser, wherein the method includes the steps of using the displacement signal to calculate a change in volume of fluid in the riser over a particular period of time (δV), and operating the flow control device to decrease the fluid pressure in the fluid flow line if there is an decrease in the

riser volume or to increase the fluid pressure in the fluid flow line if there is an increase in the riser volume.

~~21~~18. A drilling system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

~~22~~19. A method of operating a drilling system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

~~23~~20. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.