CLAIMS

We claim:

1. A combination control and check valve assembly for a wet piping system, the valve assembly comprising:

a valve body defining an inlet of the valve assembly, an outlet and a valve body fluid flow pathway therebetween;

~~a~~a quarter-turn ball valve positioned within the valve body, the ball valve comprising a rotatable ball, an upstream sealing seat ring positioned on an inlet side of the ball and a downstream sealing seat ring positioned on a downstream side of the ball, the ball having an inlet opening, an outlet opening and a ball fluid flow pathway therebetween, and the upstream and downstream seat rings being configured to substantially seal off fluid flow between an upstream side and a downstream side of the ball except for travel through the ball fluid flow pathway;

a valve actuation assembly configured to selectively rotate the ball ~~between~~substantially 90º between only two operative positions, a first operative position being an open position, fluidly connecting the ball fluid flow pathway with the valve body fluid flow pathway to permit fluid flow from the inlet to the outlet of the valve body through the ball, and a second operative position being a closed position, substantially fluidly disconnecting the ball fluid flow path from the valve body fluid flow path to substantially prevent fluid flow from the inlet to the outlet of the valve body, the valve actuation assembly including a stem extending from outside the valve body, through a first side thereof and into rotationally fixed attachment with the ball, whereby rotation of the stem rotates the ball between the open and closed positions thereof irrespective of a pressure differential across the ball;

a one-way check valve mounted within the ball, the check valve comprising an endless valve seat and a pivotable clapper disk, the clapper-disk being movable according to a pressure differential across the check valve between a closed position, wherein the clapper disk is in sealed engagement with the endless valve seat, thereby blocking fluid flow through the ball fluid flow pathway, and an open position, wherein the clapper disk is spaced away from the endless valve seat, thereby permitting fluid flow through the ball fluid flow pathway in a direction from the inlet side to the outlet side thereof;

a side opening formed in a second side of the valve body that is angularly spaced approximately 90º from the first side of the valve body, the side opening being positioned to align

with and access the ball fluid flow pathway in the closed position of the ball, and the side opening being dimensioned to permit passage of the check valve therethrough; and

a side cover removably closing the side opening.

2. The combination control and check valve assembly of claim 1, further comprising a bonnet removably mounted upon the valve body, the bonnet defining an outlet of the valve assembly.

3. The combination control and check valve assembly of ~~either of~~ claim 1 ~~or 2~~, wherein the upstream and downstream seat rings are dynamic seat rings.

4. The combination control and check valve assembly of claim 3, wherein each seat ring includes an annular groove in a peripheral sidewall thereof and a compressible O-ring mounted in the groove, the O-ring being partially compressed between the groove and an opposing inner sidewall of the valve body, the O-ring and the groove being axially reciprocal relative to one another according to a differential pressure across the seat ring to axially translate one of the O-ring and the groove relative to the other of the O-ring and the groove and further compress the O-ring between the groove and the opposing inner sidewall of the valve body.

~~5. The combination control and check valve assembly of any one of the preceding claims, wherein the check valve comprises an endless valve seat and a pivotable clapper disk, the clapper disk being in sealed engagement with the valve seat in the closed position thereof and the clapper disk being spaced away from the valve seat in the open position thereof.~~

5~~6~~. The combination control and check valve assembly of claim ~~5~~1, wherein the clapper disk is removably mounted within the ball.

6~~7~~. The combination control and check valve assembly of ~~either of~~ claim 5 ~~or claim 6~~, wherein the valve seat is integrally formed within the ball.

7~~8~~. The combination control and check valve assembly of ~~either of~~ claim ~~5 or claim 6~~1, wherein the valve seat is removably mounted within the ball.

89. The combination control and check valve assembly of ~~any one of the preceding claims~~claim 1, wherein at least the ball is coated with a corrosion resistant coating.

910. The combination control and check valve assembly of ~~any one of the preceding claims~~claim 1, wherein the side opening includes ~~a~~an outwardly extending throat from the second side of the valve body, the side cover removably covering the throat, and a water pressure relief opening is formed in a sidewall of the throat, the pressure relief opening being formed at a position covered by the side cover when removably covering the throat.

1011. The combination control and check valve assembly of ~~any one of the preceding claims~~claim 1, wherein the rotatable ball is a hollowed-out ~~fluid flow pathway comprises a bored out channel extending through the~~ ball ~~from the inlet opening to the outlet opening~~.