

## Technical Explanation

The QL8 wax capsule thermostatic element is factory pre-set and can be adjusted in the factory to meet customer defined temperature settings depending on the end user requirements.

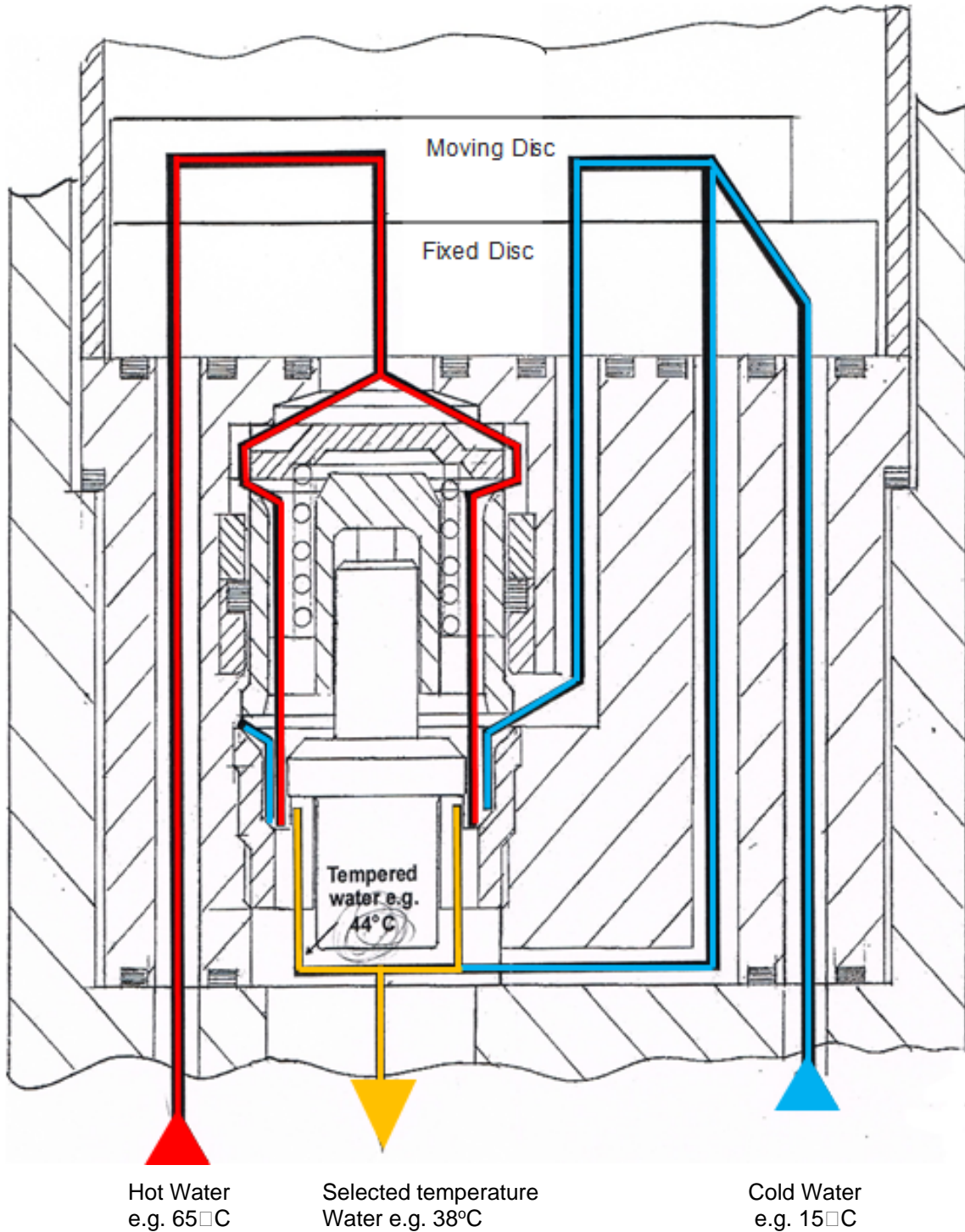
- Customers may define a maximum factory pre-set temperature in the range of 38°C to 48.9°C. Minor variations are achieved at the factory by adjustment settings whilst significant variations are achieved by selection of the thermostatic element designed to meet specific maximum temperatures e.g. 38°C, 41°C, 45°C or 48°C. Once the factory pre-set temperature has been specified and set the mixer/faucet user cannot exceed the specified maximum temperature.
- When the single lever mixer handle is moved to the full hot position all the water is passing over the thermostatic element which controls the temperature to the pre-set maximum. As the mixer handle is moved from the full hot position toward a cooler desired temperature, a second and unique cold water port is gradually opened which allows cold water to by-pass the thermostatic element and introduce cold water below the element. Thermostatically tempered water passing from the thermostatic element chamber is always at the factory pre-set maximum temperature. As the single lever handle is turned toward the cold, more cold water is introduced from the by-pass. On full cold all the output water flows from the by-pass and water to the thermostatic element is closed off. This cartridge design has the inbuilt advantage of a thermostatic element that will shut down the hot water supply if the cold water supply fails.
- The design of the QL8 ensures that when the ceramic discs are closed there is no mains supply pressure on the element. This feature gives better durability and reduces the likelihood of leakage over time or under high pressure.
- The internal dual flow, incorporating the cold water by-pass system allows independent flow control at all temperatures up to but not exceeding the factory pre-set temperature.
- Temperature stability is important particularly in shower mixer applications. The QL8 system provides better temperature stability than manual shower mixers. This is because at normal showering temperatures most of the QL8 outlet flow is passing through the thermostatic element chamber and temperature variations caused by changes in inlet temperature and pressures are adjusted by the thermostatic element.

- The QL8 design concept also allows for significant savings in energy. The factory pre-set maximum temperature ensures that excessive hot water is not used when running the water to waste. Practical examples of this would be where tableware is rinsed in a kitchen sink using hot water with the water running to waste. The QL8 cartridge for this application would have a factory pre-set maximum temperature of 48°C (recommended by UK, TMV2 for safety and hygiene requirements) which is both safe for this application and energy efficient. Faucet cartridges that do not include the QL8 thermostatic factory pre-set maximum temperature tend to be used by consumers to rinse tableware, for example, using much higher temperatures, generally 60°C-65°C which increases both scalding risk and wastage. In general domestic use applications, it has been estimated the QL8 could result in water heating energy savings of up to 10% as a direct result of reduced wastage.
- An approved pressure balance valve when used in conjunction with the QL8 further enhances control of temperature variation caused by changes in inlet pressures and will also add both hot and cold water cut off in the case of either cold or hot water failure and thereby prevent scalding and thermal shock. Therefore, the incorporation of an approved pressure balance valve will add a second hot water supply shutdown safe guard in the case of cold water supply failure. The combination of the QL8 single lever thermostatic cartridge and an approved pressure balance valve in a shower mixer will ensure the highest UK, European, USA, Canada and Australia standards are achieved.
- The QL8 is a standard 40mm diameter cartridge with standard connection inlets and spigot fittings.

# QL8 Figures and Diagrams

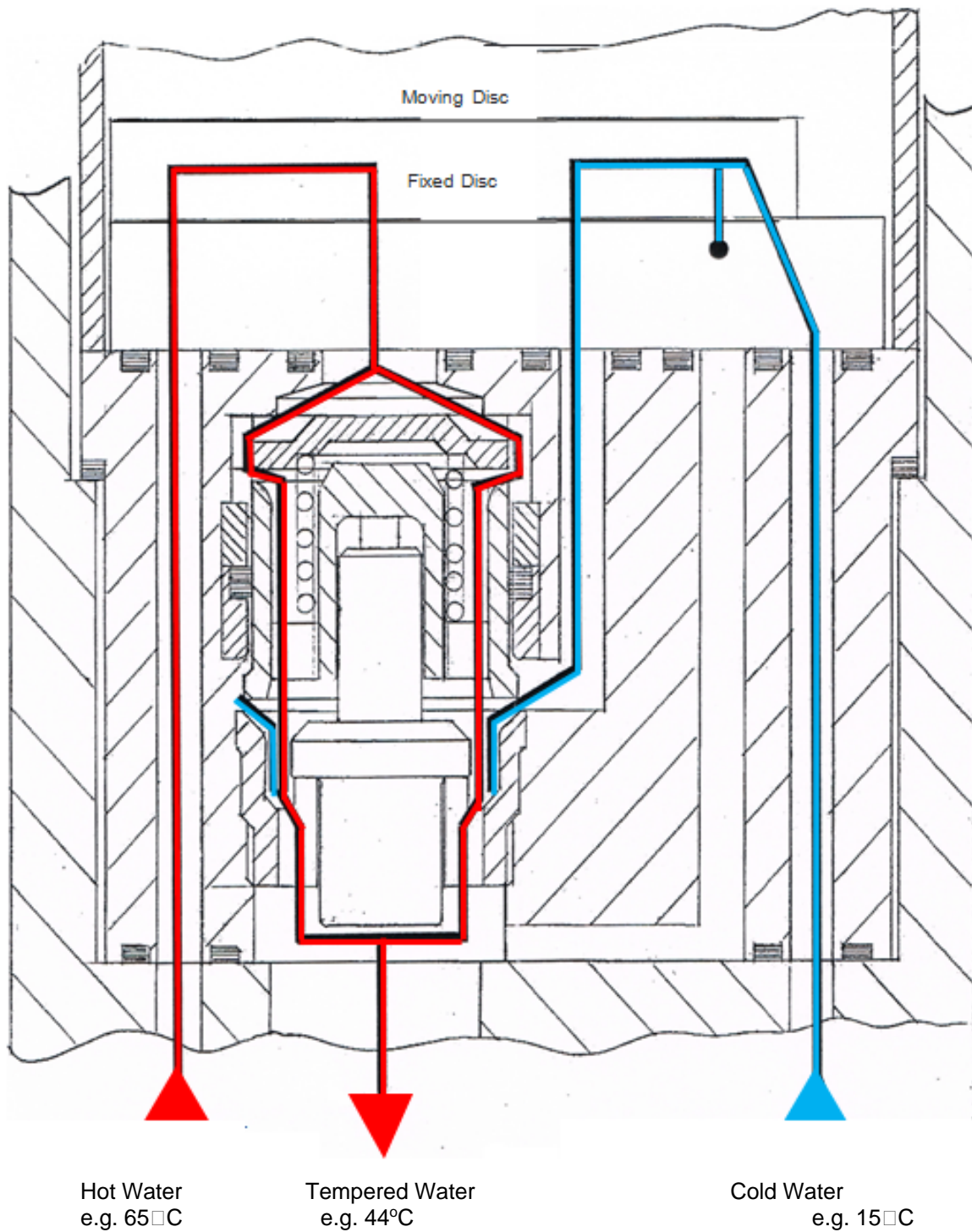
## 1.1. QL8 in Selected Temperature Mode

Figure 1. Selected Temperature Mode



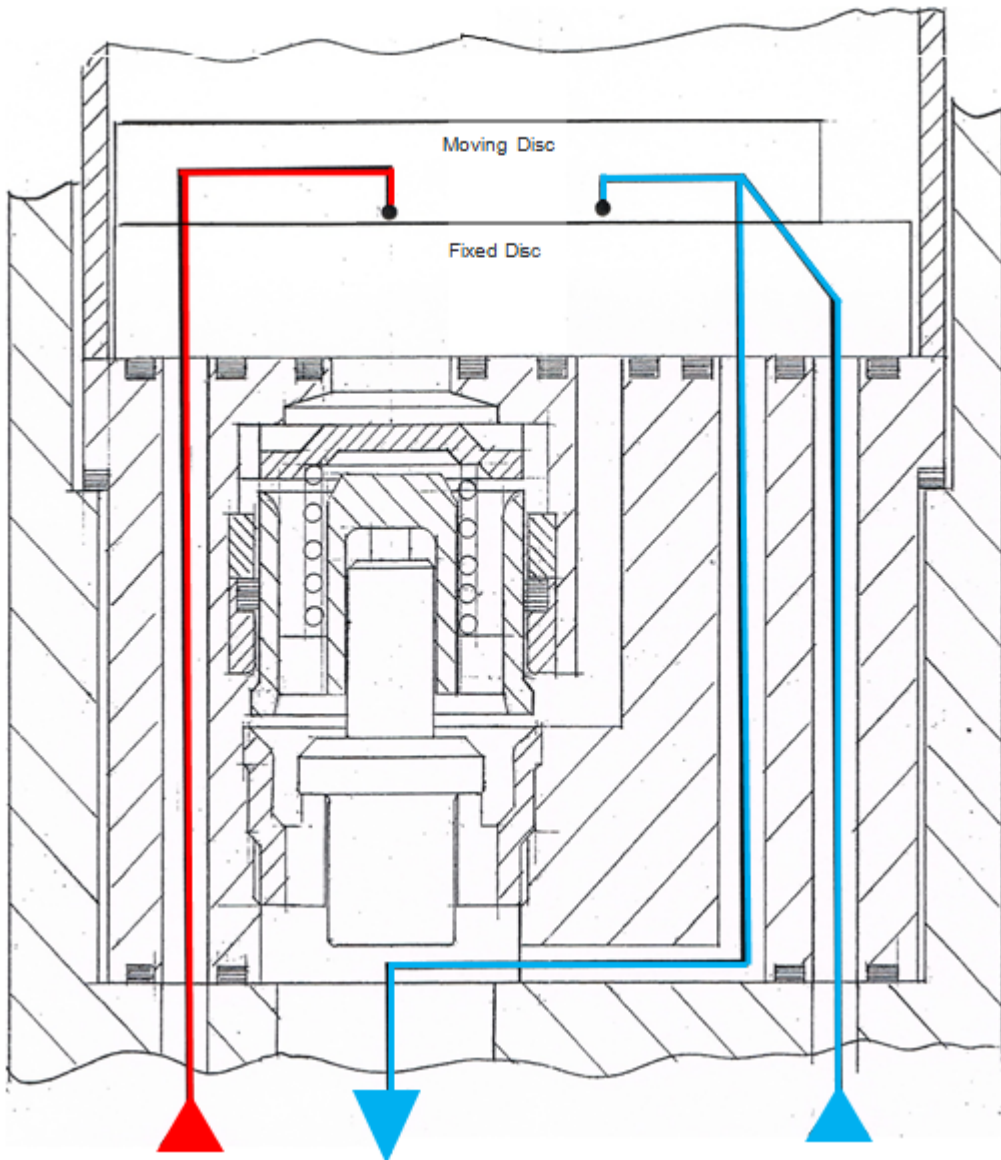
## 1.2. QL8 in Maximum Temperature Mode

Figure 2. Maximum Factory Pre-set Delivery Mode



### 1.3. QL8 in Cold Delivery Mode

Figure 3. Cold Delivery Mode



Hot Water  
e.g. 65°C

Cold Water  
e.g. 15°C

Cold Water  
e.g. 15°C