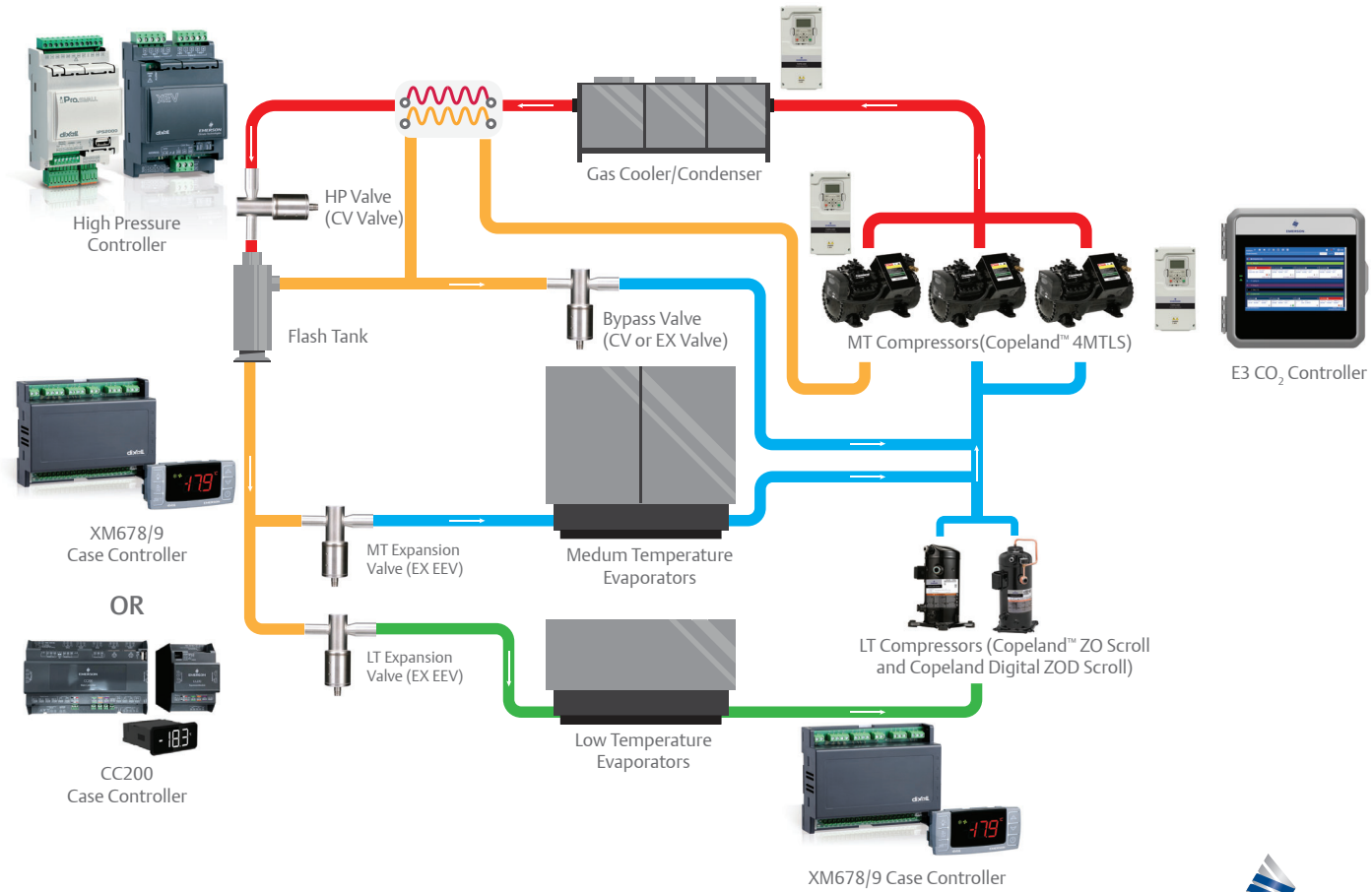
Transcritical CO_2 Booster System

This R-744 (CO_2) system shares the same refrigerant in both the MT and LT. The LT compressors discharge into the suction of the MT compressors. As ambient temperatures rise above approximately 75°F, the compressors discharge pressure can exceed the CO_2 critical point of 87.8°F or 1055 psig (72.8 bar). At this point the condenser then acts as a gas cooler and reduces the temperature of the discharge gas without condensing it into liquid. The supercritical fluid exiting the gas cooler then passes through a high pressure reducing valve (HP Valve). The pressure drop produces a saturated condition that provides liquid and vapor to the flash tank (Receiver). Pressure in the flash tank is typically controlled to 450 to 520psig (30 to 36 bar).

The liquid is then distributed to the MT and LT cabinets via the liquid line at this intermediate pressure. The excess flash gas flash tank is typically diverted via a Bypass Valve to the suction of the MT compressors. In warm ambient regions a separate compressor(s) referred to as Parallel compressor may be used to manage the excess flash gas & improved energy efficiency.

Typical CO_2 Transcritical Booster System



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