Model: WD-720-ES-4T

Dynamic Pressure-Reducing Control Valve

with Electronic Multi Level Setting (Pneumatically) Controlled by Technolog-Modulo Controller

The Model WD-720-ES-4T is a dynamic pressure reducing valve.
Equipped with a unique Multi-Setting Pneumatic Controlled unit (MSPC) which responds to a Modulo controller by changing the pilot's set point according to a programmed time and flow function.

Features and Benefits

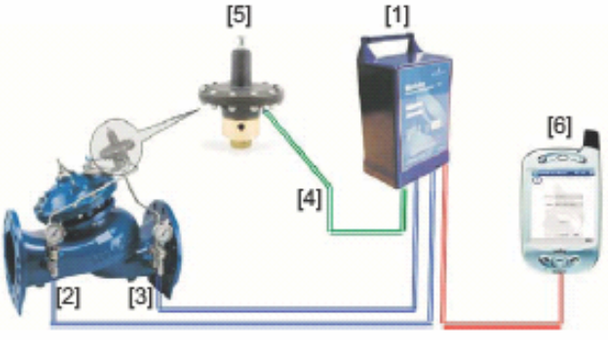
- Hydraulic Pressure Control
  - Line pressure driven
  - Protects downstream even during zero demand
- User-Friendly Design
  - Easy pressure setting
  - Simple in-line inspection and service
  - Easy addition of control features
- Designed to stand up to the toughest conditions
  - Excellent anti-cavitation properties
  - Silent operation suitable for urban areas
  - Wide flow range
  - High stability and accuracy
- Double chamber design
  - Moderated valve reaction
  - Protected diaphragm
- Flexible design – Easy addition of features
- Obstacle free, full bore – Free flow pass
- V-Port Throttling Plug – Very low flow stability
- In-line serviceable – Easy maintenance

Applications Guide

- Pressure Reducing Systems
- Pressure Management and Leakage Control

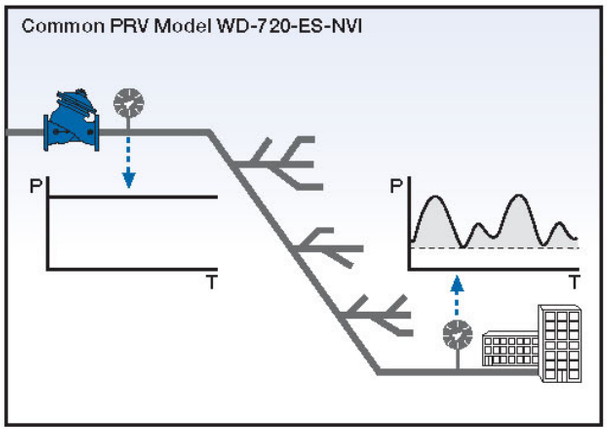
Operation

The Modulo controller [1] receives continues readings of flow and up-downstream pressure [2] [3] and provides pneumatic pressure to the MSPC unit [4], changing the pilot set point according to pressure & flow or pressure & time functions.
The Pressure Reducing Pilot [5] commands the Hydrometer to throttle closed when downstream pressure rises above pilot setting, and modulate open when it drops below pilot setting.
A standard PDA [6] allows programming and data downloading.

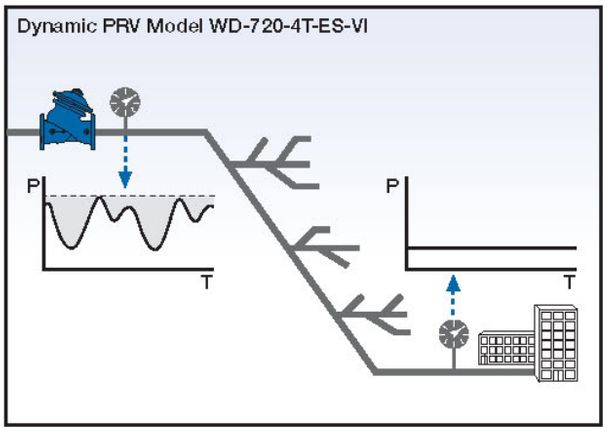


Bermad Pressure Control Solutions

A well-planned pressure management program can significantly reduce not only volumes of real loss, but also maintenance costs by reducing occurrence of bursts and thereby extending the life of the system.



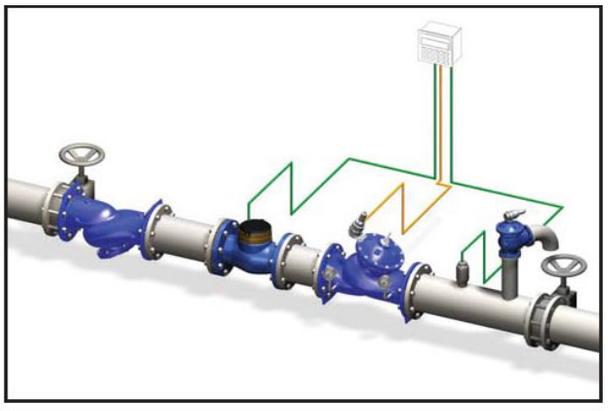
Common PRVs are set to maintain a constant low downstream pressure, ensuring sufficient pressure at the system's critical point during peak demand (when line friction head loss is highest). The shaded area represents the hours and levels when pressure is higher than required.



The dynamic PRV - Model WD-720-ES-4T-V, integrated with a PR controller, is designed to continuously correct its set value based on the momentary demand and/or minimum required pressure at the system critical point. As a result, the average network pressure dramatically decreases, reducing system leakage, bursts, maintenance, and energy costs. The shaded area represents the hours and levels of reduced leakage.

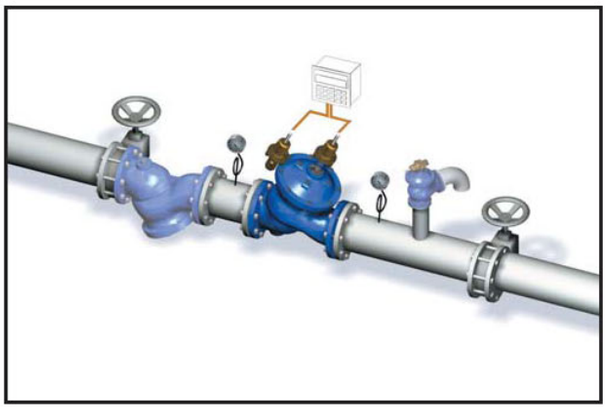
Flow Function Control

Data logging, and analysis of the distribution network parameter values, enable establishment of a function for real time adjustment of pressure per system demand. The flow and pressure transducers continuously transmit to the controller, which reacts by adjusting the Model WD-720-4T-ES-VI according to the pre-established function. The controller's program can be changed either through a laptop computer or a pocket PC, SMS, or any other communication method available.



Time Function Control

The PRV model WD-720-45-ES-VI integrated with the BE-PRV-DL controller, is designed to maintain two pressure reducing set-point values. The BE-PRV-DL controller is programmed to switch between the two pilot valves and therefore change the pressure reducing set-point. The BE-PRV-DL control program can adapt to special days, or seasons of the year, as well as log pressure and flow data.



Pressure Management

The foundation for effective leakage management

Introduction

In the UK and several other countries it has been widely recognized for at least 25 years that pressure has a fundamental influence on average leakage rates in distribution systems and this influence is usually significantly greater than the theoretical relationship between pressure P and discharge rate Q through an orifice (P varies with $Q^{0.5}$). But in many other countries and Utilities, pressure management is still unfortunately considered as only marginally relevant - or not relevant at all - to leakage management. However, an ever-increasing number of countries and Utilities are now recognizing that good pressure management is the fundamental foundation of good leakage and infrastructure management. The weight of evidence now available, and the ever improving reliability with which technical and economic predictions can be made, are such that progressive Utilities can no longer afford to ignore investigating possibilities of pressure management in their systems. Pressure management for leakage control, in its widest sense, can be defined as "The practice of managing system pressures to the optimum levels of service ensuring sufficient and efficient supply to legitimate uses and consumers, while reducing unnecessary or excess pressures, eliminating transients and faulty level controls all of which cause the distribution system to leak unnecessarily" The Water Losses Task Force promotes the use of a '4-Component' diagram for managing Real Losses; Figure 1 shows that Pressure Management also has a major influence on the other components, as reduction of excess pressures and surges usually reduce the numbers of new leaks - sometimes to a major degree – resulting in:

- Fewer reported bursts, lower repair costs, shorter run-times, reduced repair backlogs
- Fewer unreported bursts, lower rates of rise of unreported leakage, less frequent interventions, lower economic volume of unreported leakage, lower annual intervention and repair costs
- Reduced investments in mains and services replacement programs, if criteria are based on replacement in 'X' number of bursts occur in 'Y' km of pipes in 'Z' years.

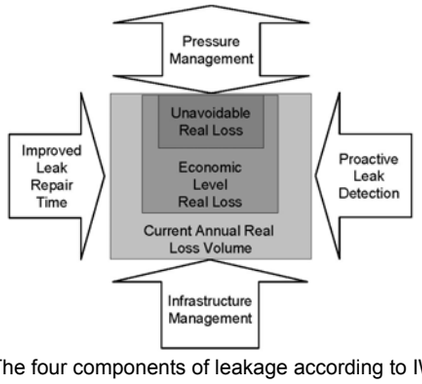


Figure 1: The four components of leakage according to IWA WLTF

Pressure management

Pressure management, in its widest sense, can be defined as the practice of managing system pressures to the optimum levels of service ensuring sufficient and efficient supply to legitimate uses and consumers, while reducing unnecessary or excess pressures, eliminating transients and faulty level controls all of which cause the distribution system to leak unnecessarily. In many cases pressure management addresses not only the effect of real losses but also the cause making it one of the most efficient tools for sustainable control of real loss.

Pressure management programs often have positive impacts on apparent loss reduction and revenue recovery, especially in relation to theft and authorized unbilled consumption. Where customers have roof tanks, pressure management often improves effectiveness of ball valve closure, and improves metering accuracy by reducing the duration of extremely low flows ('ball valve tails') which some meters cannot record. *(Thornton, Leakage2005)*