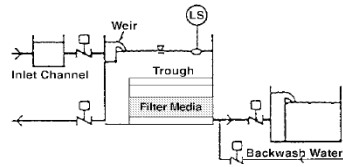


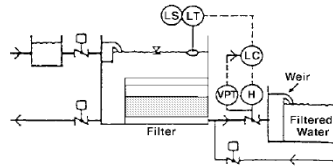
# Filtration: Rate Control Filtrasyon Hız Kontrol Metodları

Dr. A. Saatci

## Filtre Çıkış Suyu Kontrolü

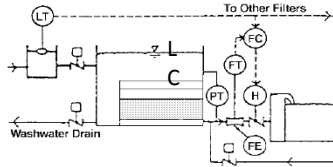


Variable Level Influent Flow Splitting

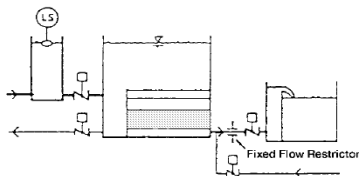


Proportional Level Influent Flow Splitting

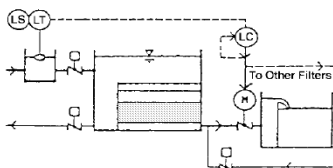
- LEGEND**
- FC Flow Controller
  - FE Flow Element
  - FT Flow Transmitter
  - LC Level Controller
  - LS Level Switch
  - LT Level Transmitter
  - M Modulating Actuator
  - PT Pressure Transmitter
  - VPT Valve Position Transmitter



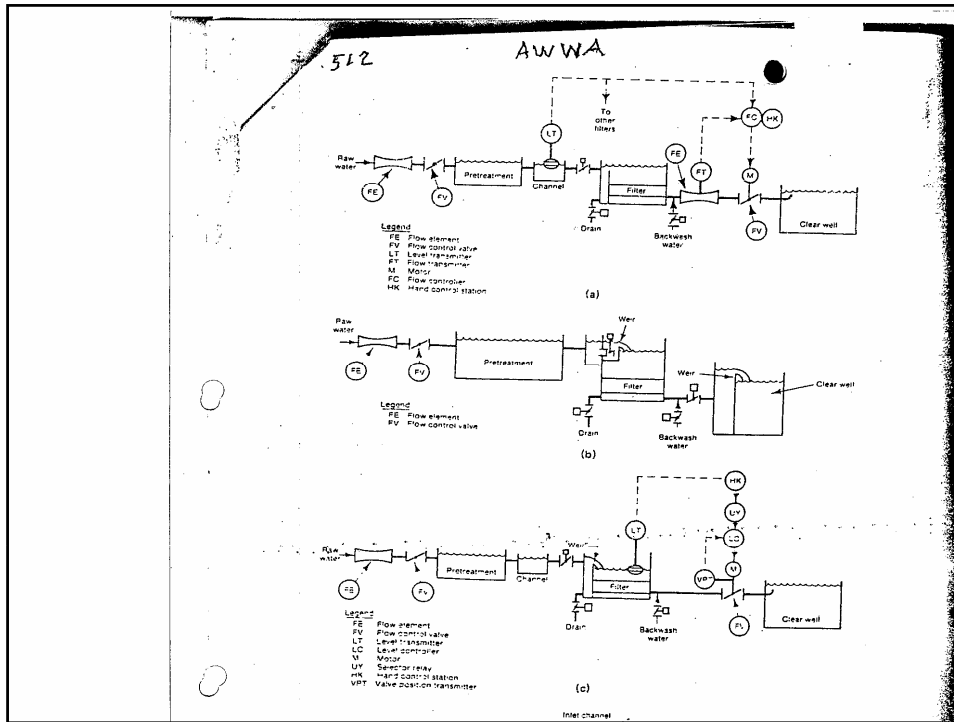
Proportional Level Equal Rate



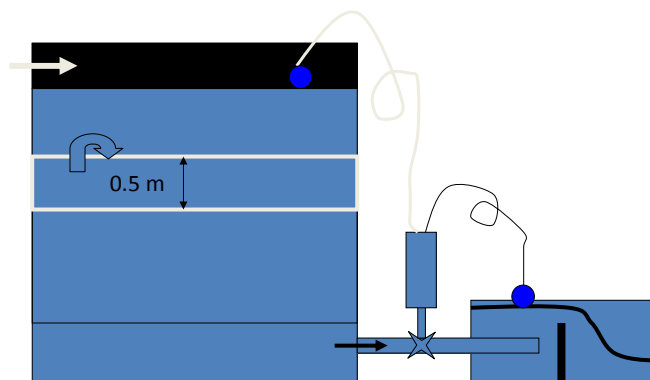
Variable Level Declining Rate



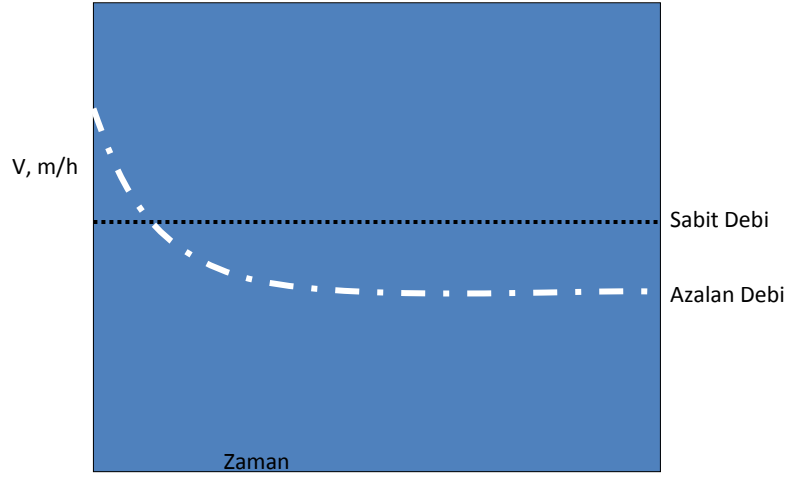
Proportional Level Declining Rate



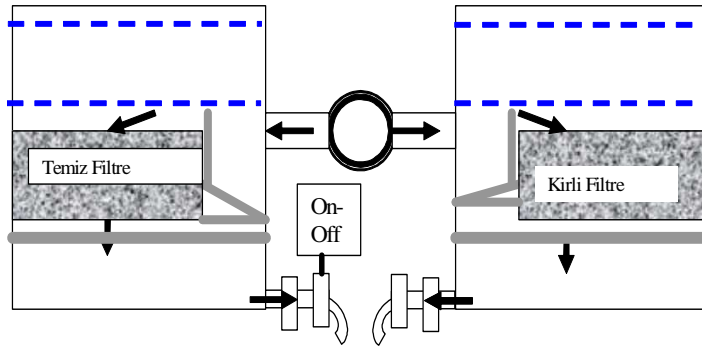
## Varibar Sistemi



## Azalan Debili Filtre



## Azalan Debili Filtreler



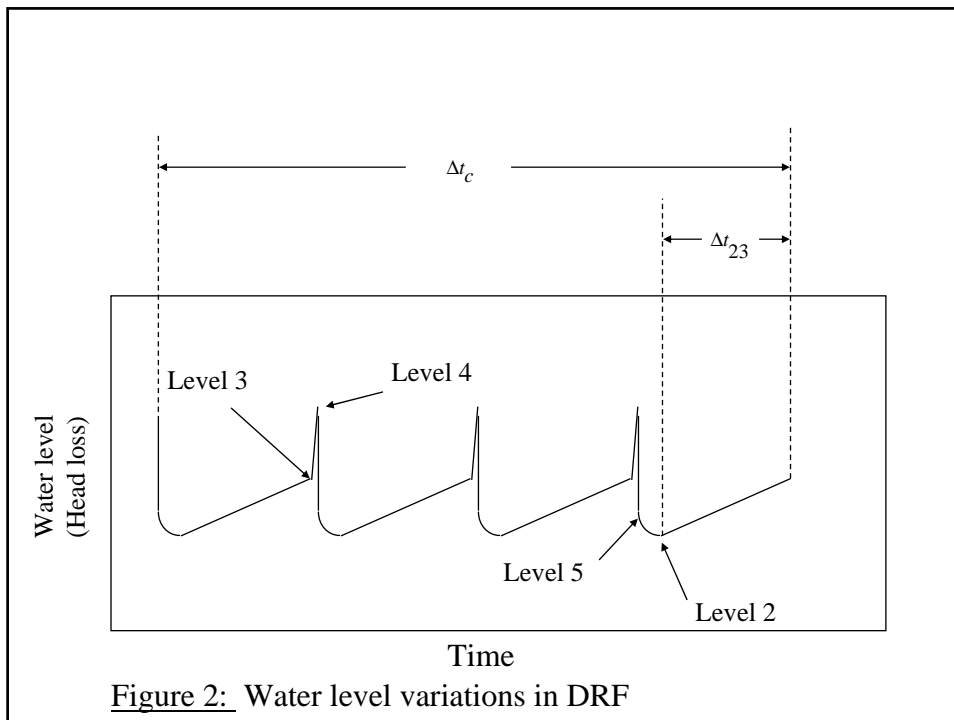


Figure 2: Water level variations in DRF

DECLINING RATE FILTRATION:

Head

FILTRATION TIME

Level 1. If all filters were in service in a clean condition, Level 1 can be calculated by summing the clean filter headlosses at  $v_D = \text{design filtration rate}$ .

Level 3. Maximum water level just before initiation of the backwash of the dirtiest filter.

Level 2. Since the slopes of HL for DRF and CRF are same (experimental evidence), Level 3 - Level 2 = constant rate filter HL / No of filters.

Clean Filter Level 3

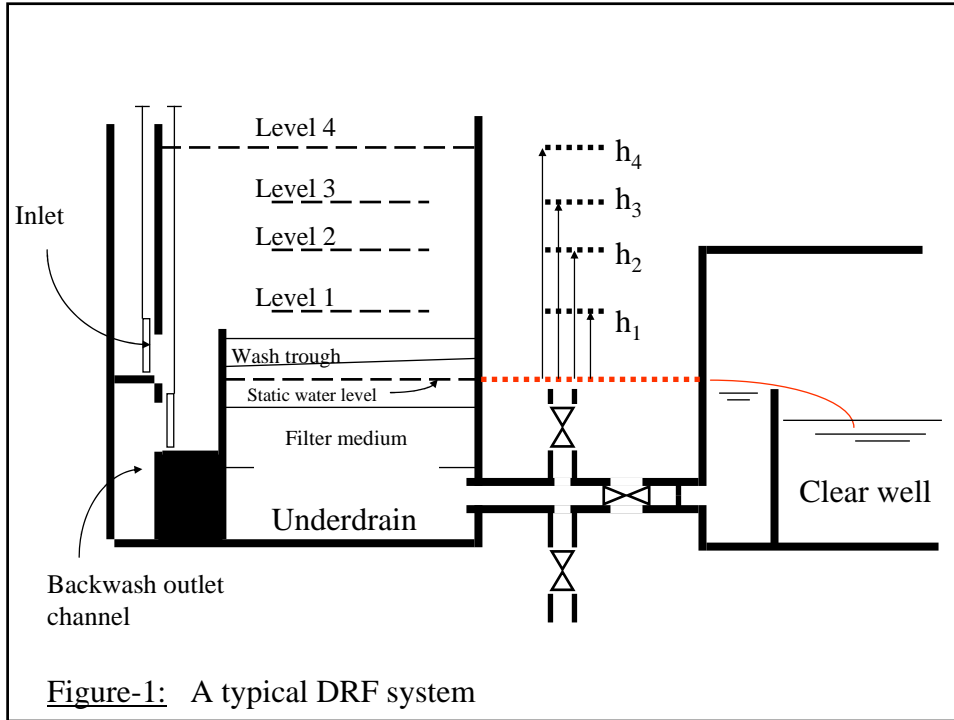
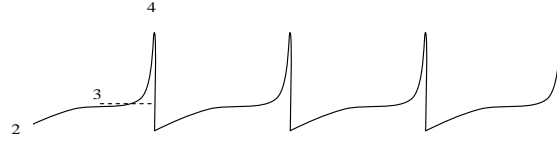
Dirty Filter Level 3

Level 3 =  $K_1 (1.5 v_D) +$       Level 3 =  $K_1 (0.7 v_D) +$

## Azalan Debili Filtre Boyutlandırması

	Temiz Filtre	Kirli Filtre
Seviye 3=	$K1(1.5*Vd) +$	$K1(0.7*Vd) +$
	$K2*(1.5*Vd)^2 +$	$K2*(0.7*Vd)^2 +$
	$K3*(1.5*Vd)^2$	$K3*(0.7*Vd)^2$
	0	1.4

K1= 36e-3 h Temiz kum yük kaybı sabiti  
 K2= 1,521 e-3 h2/m Borular, vanalar..  
 K3= Kontrol vanası (bilinmeyen)



## Filtre Boyutlandırması

- Temiz yatak yük kaybı= 0.3 – 0.6 m
- Kirlenme yük kaybı = 2.4 to 3.0 m
- Giriş boru hızları = 0.6 m/sec
- Filtre edilmiş su ve geri yıkama hatları= 0.9-1.8 m/sec
- Su derinliği, yatak üst seviyesinden en az 1 m. yukarıda.
- Yüksek filtre hızlarında 1.5 m veya daha fazla.

