Model component name	Notation	Flux name	Discrete formulations	Continuous formulation
Production store	S	Precipitation in the store	$P_\mathrm{s} = \frac{x_1\left(1-\left(\frac{S}{x_1}\right)^\alpha\right)\tanh\frac{P_\mathrm{n}}{x_1}}{1+\frac{S}{x_1}\tanh\frac{P_\mathrm{n}}{x_1}}$	$P_\mathrm{s} = P_\mathrm{n}\left(1-\left(\frac{S}{x_1}\right)^\alpha\right)$
		Evaporation from the store	$E_\mathrm{s} = \frac{\left(2S-\frac{S^\alpha}{x_1}\right)\tanh\frac{E_\mathrm{n}}{x_1}}{1+\left(1-\frac{S}{x_1}\right)\tanh\frac{E_\mathrm{n}}{x_1}}$	$E_\mathrm{s} = E_\mathrm{n}\left(2\frac{S}{x_1}-\left(\frac{S}{x_1}\right)^\alpha\right)$
		Percolation	$\mathrm{Perc} = S\left(1-\left(1+\left(\nu\frac{S}{x_1}\right)^{\beta-1}\right)^{\frac{1}{1-\beta}}\right)$	$\mathrm{Perc} = \frac{x_1^{1-\beta}}{(\beta-1)U_t}\nu^{\beta-1}S^\beta$
Unit hydrograph	UH_2	UH inflow	$P_\mathrm{r} = P_\mathrm{n} - P_\mathrm{s} + \mathrm{Perc}$	–
		UH outflow	$Q_\mathrm{uh} = P_\mathrm{r} * \mathrm{UH}_2^{(*)}$ (convolution product)	
Nash cascade	$S_{h,1}$	Precipitation inflow in store 1	$P_\mathrm{r} = P_\mathrm{n} - P_\mathrm{s} + \mathrm{Perc}$	$P_\mathrm{r} = P_\mathrm{n} - P_\mathrm{s} + \mathrm{Perc}$
		Store 1 outflow	$Q_{Sh,1} = S_{h,1}\left(1-\exp\left(\frac{1-\mathrm{nres}}{x_4}\right)\right)$	$Q_{Sh,1} = \frac{\mathrm{nres}-1}{x_4}S_{h,1}$
	$S_{h,2}$	Store 2 inflow	$Q_{Sh,1}$	$Q_{Sh,1}$
		Store 2 outflow	$Q_{Sh,2} = S_{h,2}\left(1-\exp\left(\frac{1-\mathrm{nres}}{x_4}\right)\right)$	$Q_{Sh,2} = \frac{\mathrm{nres}-1}{x_4}S_{h,2}$
	$\vdots$	$\vdots$	$\vdots$	$\vdots$
	$S_{h,n}$	Store nres inflow	$Q_{Sh,\mathrm{nres}-1}$	$Q_{sh,\mathrm{nres}-1} = \frac{\mathrm{nres}-1}{x_4}S_{h,\mathrm{nres}-1}$
		Store nres outflow	$Q_\mathrm{uh} = S_{h,\mathrm{nres}}\left(1-\exp\left(\frac{1-\mathrm{nres}}{x_4}\right)\right)$	$Q_\mathrm{uh} = \frac{\mathrm{nres}-1}{x_4}S_{h,\mathrm{nres}}$
Routing store	R	Routing store inflow	$Q_9 = \Phi Q_\mathrm{uh}$	$Q_9 = \Phi Q_\mathrm{uh}$
		Inter-catchment exchanges	$F = \frac{x_2}{x_3^\omega}R^\omega$	$F = \frac{x_2}{x_3^\omega}R^\omega$
		Routing store outflow	$Q_\mathrm{r} = R\left(1-\left(1+\left(\frac{R}{x_3}\right)^{\gamma-1}\right)^{\frac{1}{1-\gamma}}\right)$	$Q_\mathrm{r} = \frac{x_3^{1-\gamma}}{(\gamma-1)U_t}R^\gamma$
Output flow	$Q = Q_\mathrm{r} + Q_\mathrm{d}$	Routing store outflow	Q_r	Q_r
		Direct flow	$Q_\mathrm{d} = \max(0; (1-\Phi)Q_\mathrm{uh} - F)$	$Q_\mathrm{d} = \max(0; (1-\Phi)Q_\mathrm{uh} - F)$