

% Assumption: low and high alarm hysteresis regions do not overlap

HIGH_LIMIT: **TYPE** =

[l: [tick -> real], eps: [tick -> posreal] ->
 { h: [tick -> real] | **FORALL** (t: tick): h(t) - eps(t) > l(t) + eps(t) }]

% Inputs

X, L : **VAR** [tick -> real]
EPS : **VAR** [tick -> posreal]
H : **VAR** HIGH_LIMIT

% Outputs

QH, Q, QL : **VAR** [tick -> bool]

LIMITS_ALARM_fbd_impl (X, H, L, EPS, QH, Q, QL): bool =
 EXISTS (w1: [tick -> posreal]), (w2, w3: [tick -> real]):
 DIV(EPS, (LAMBDA (t: tick): 2.0), w1)
 & SUB(H(L, EPS), w1, w2)
 & ADD(L, w1, w3)
 & HYSTERESIS_tab_req(X, w2, w1, QH)
 & HYSTERESIS_tab_req(w3, x, w1, QL)
 & DISJ(QH, QL, Q)