

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

HIGH\_LIMIT: **TYPE** =

[ l: [tick -> real], eps: [tick -> real] ->

{ h: timed\_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)