

Common selections				
M selection	2 “high-purity” tracks, opposite sign			
	$ \eta^{\text{trk}} < 2.5, p_T^{\text{trk1}} > 20 \text{ GeV}, p_T^{\text{trk2}} > 5 \text{ GeV}, \eta^{\text{M}} < 2.1$			
$0.62 < m_{\pi\pi} < 0.92 \text{ GeV } (\rho^0) / 1.008 < m_{\text{KK}} < 1.032 \text{ GeV } (\phi) / 0.84 < m_{\text{K}\pi} < 0.94 \text{ GeV } (\text{K}^{*0})$				
Category	ggH	VBF high- p_T^γ	VBF low- p_T^γ	VH
Trigger	Photon + jet with τ -ID	high- p_T photon + VBF-like jets	Photon + jet with τ -ID	Double or single lepton
p_T^γ [GeV]	> 38	> 75	> 38 and < 75	> 40
$ \eta^\gamma $	< 2.5	< 1.4	< 2.1	< 2.5
γ -ID signal eff.	80%	90%	80%	90%
p_T^{M} [GeV]	> 38	> 30	> 38	> 38
$I^{\text{trk}}(M)$	> 0.9	> 0.9	> 0.9	> 0.8
$I^{\text{neu}}(M)$	> 0.8	-	-	-
Event tagging	Meson candidate within a jet with $p_T^{\text{j}} > 40 \text{ GeV}$, tracks with $\Delta R < 0.07$	2 jets with $p_T^{\text{j}} > 40 \text{ GeV}$ $m_{\text{jj}} > 400 \text{ GeV}$ $ \Delta\eta_{\text{jj}} > 3$	2 jets with $p_T^{\text{j}} > 30/20 \text{ GeV}$ $m_{\text{jj}} > 300 \text{ GeV}$ $ \Delta\eta_{\text{jj}} > 3$	1 selected and isolated e/μ or 2 selected e/μ compatible with Z mass
BDT categories				
cat0	BDT > 0.55	BDT > 0.7	BDT > 0.7	-
cat1	$-0.4 < \text{BDT} < 0.55$	$-0.6 < \text{BDT} < 0.7$	$-0.6 < \text{BDT} < 0.7$	-