## Basis Warsaw (EFT SMEFT)

Basis suggested by Grzadkowski, Iskrzyński, Misiak, and Rosiek (arXiv:1008.4884v3). At variance with their definition, the Wilson coefficients are defined to be dimensionful, such that  $\mathcal{L} = \sum_i C_i O_i$ . The set of redundant operators coincides with the choice of DSixTools (arXiv:1704.04504). The weak basis for the fermion fields is chosen such that the running dimension-6 mass matrices of charged leptons and down-type quarks are diagonal at the scale where the coefficient values are specified, while up-type quark singlet field is rotated to diagonalise the running dimension-6 up-type quark mass matrix "from the right".

## Sectors

The effective Lagrangian is defined as

$$\mathcal{L}_{\text{eff}} = -\mathcal{H}_{\text{eff}} = \sum_{O_i = O_i^{\dagger}} C_i O_i + \sum_{O_i \neq O_i^{\dagger}} \left( C_i O_i + C_i^* O_i^{\dagger} \right).$$

dB=dL=0

| WC name    | Operator   | Type            |
|------------|--|-----------------|
| G          | $f^{ABC}G^{A u}_{\mu}G^{B ho}_{ u}G^{C\mu}_{ ho}$  | R               |
| Gtilde     | $f^{ABC}\widetilde{G}^{A u}_{\mu}G^{B ho}_{ u}G^{C\mu}_{ u}$   | R               |
| W          | $\epsilon^{IJK}W_{\mu}^{I u}W_{ u}^{J ho}W_{ u}^{K\mu}$  | R               |
| Wtilde     | $\epsilon^{IJK}\widetilde{W}_{\mu}^{I u}W_{ u}^{J ho}W_{ ho}^{'K\mu}$  | ${ m R}$        |
| phi        | $\left(arphi^\daggerarphi ight)^3$   | R               |
| phiBox     | $\left(arphi^\daggerarphi ight)\square\left(arphi^\daggerarphi ight)$  | R               |
| phiD       | $\left(arphi^\dagger D^\mu arphi ight)^* \left(arphi^\dagger D_\mu arphi ight)$  | R               |
| phiG       | $arphi^\dagger arphi G^A_{\mu u} G^{A\mu u} \ arphi^\dagger arphi B_{\mu u} B^{\mu u}$   | R               |
| phiB       | $arphi^\dagger arphi B_{\mu u}^{} B^{\mu u}$   | R               |
| phiW       | $arphi^\dagger arphi W^I_{\mu u} W^{I\mu u}$   | R               |
| phiWB      | $arphi^\dagger 	au^I arphi W^I_{\mu u} B^{\mu u}$  | R               |
| phiGtilde  | $arphi^{\dagger} arphi \overset{\mu}{\widetilde{C}} \overset{\mu}{A} \overset{\mu}{C} \overset{\mu}{C} \overset{\mu}{A} \overset{\mu}{\mu} \overset{\nu}{V}$ | R               |
| phiBtilde  | $arphi^{\intercal}arphi B_{\mu u} B^{\mu u}$   | R               |
| phiWtilde  | $arphi^\dagger arphi \widetilde{W}^I_{\mu u} W^{I\mu u}$   | R               |
| phiWtildeB | $arphi^\dagger 	au^I arphi \widetilde{W}^I_{\mu u} B^{\mu u}$  | R               |
| uphi_11    | $\left(arphi^\daggerarphi ight)\left(ar{q}_1u_1\widetilde{arphi} ight)$  | $\mathbf{C}$    |
| uphi_12    | $\left(arphi^\daggerarphi ight)\left(ar{q}_1u_2\widetilde{arphi} ight)$  | $\mathbf{C}$    |
| uphi_13    | $\left(arphi^\daggerarphi ight)\left(ar{q}_1u_3\widetilde{arphi} ight)$  | $\mathbf{C}$    |
| uphi_21    | $\left(arphi^\daggerarphi ight)\left(ar{q}_2u_1\widetilde{arphi} ight)$  | $^{\mathrm{C}}$ |
| uphi_22    | $\left(arphi^\daggerarphi ight)\left(ar{q}_2u_2\widetilde{arphi} ight)$  | $^{\mathrm{C}}$ |
| uphi_23    | $\left(arphi^\daggerarphi ight)\left(ar{q}_2u_3\widetilde{arphi} ight)$  | $^{\mathrm{C}}$ |

| WC name | Operator  | Type                                  |
|---------|---|---------------------------------------|
| uphi_31 | $\left(\varphi^{\dagger}\varphi\right)\left(\bar{q}_{3}u_{1}\widetilde{\varphi}\right)$ | C                                     |
| uphi_32 | $\left(arphi^\daggerarphi ight)\left(ar{q}_3u_2\widetilde{arphi} ight)$                 | $^{\mathrm{C}}$                       |
| uphi_33 | $\left(arphi^\daggerarphi ight)\left(ar{q}_3u_3\widetilde{arphi} ight)$                 | $\mathbf{C}$                          |
| dphi_11 | $\left(arphi_{_{\parallel}}^{\dagger}arphi ight)\left(ar{q}_{1}d_{1}arphi ight)$        | $^{\mathrm{C}}$                       |
| dphi_12 | $\left(arphi_{_{-}}^{\dagger}arphi ight)\left(ar{q}_{1}d_{2}arphi ight)$                | $^{\mathrm{C}}$                       |
| dphi_13 | $\left(arphi^\daggerarphi ight)\left(ar{q}_1d_3arphi ight)$                             | $\mathbf{C}$                          |
| dphi_21 | $\left(arphi^\daggerarphi ight)\left(ar{q}_2d_1arphi ight)$                             | C                                     |
| dphi_22 | $\left(arphi_{\perp}^{\dagger}arphi ight)\left(ar{q}_{2}d_{2}arphi ight)$               | C                                     |
| dphi_23 | $\left(arphi_{_{\perp}}^{\dagger}arphi ight)\left(ar{q}_{2}d_{3}arphi ight)$            | $\stackrel{	ext{C}}{\sim}$            |
| dphi_31 | $\left(arphi_{_{\pm}}^{\dagger}arphi ight)\left(ar{q}_{3}d_{1}arphi ight)$              | $\stackrel{	ext{C}}{\sim}$            |
| dphi_32 | $\left(arphi_{_{\pm}}^{\dagger}arphi ight)\left(ar{q}_{3}d_{2}arphi ight)$              | $\stackrel{	ext{C}}{	ilde{	ilde{c}}}$ |
| dphi_33 | $\left(arphi^\daggerarphi ight)\left(ar{q}_3d_3arphi ight)$                             | C                                     |
| ephi_11 | $\left(arphi_{_{\pm}}^{\dagger}arphi ight)\left(ar{\ell}_{_{1}}e_{1}arphi ight)$        | C                                     |
| ephi_12 | $\left(arphi^\daggerarphi ight)\left(ar\ell_1e_2arphi ight)$                            | C                                     |
| ephi_13 | $\left(arphi_{_{\pm}}^{\dagger}arphi ight)\left(ar{\ell}_{1}e_{3}arphi ight)$           | C                                     |
| ephi_21 | $\left(arphi^\daggerarphi ight)\left(ar\ell_2e_1arphi ight)$                            | C                                     |
| ephi_22 | $\left(arphi^{\dagger}arphi ight)\left(ar{\ell}_{2}e_{2}arphi ight)$                    | $\stackrel{	ext{C}}{\sim}$            |
| ephi_23 | $\left(arphi_{_{\pm}}^{\dagger}arphi ight)\left(ar{ar{\ell}}_{2}e_{3}arphi ight)$       | $\stackrel{	ext{C}}{\sim}$            |
| ephi_31 | $\left(arphi^{\dagger}arphi ight)\left(ar{\ell}_{3}e_{1}arphi ight)$                    | $\stackrel{	ext{C}}{\sim}$            |
| ephi_32 | $\left(arphi_{_{\perp}}^{\dagger}arphi ight)\left(ar{ar{\ell}}_{_{3}}e_{2}arphi ight)$  | C                                     |
| ephi_33 | $\left(arphi^\daggerarphi ight)\left(ar\ell_3e_3arphi ight)$                            | C                                     |
| eW_11   | $\left(\ell_1\sigma^{\mu u}e_1 ight)	au^Iarphi W^I_{\mu u}$                             | C                                     |
| eW_12   | $\left(ar{\ell}_1\sigma^{\mu u}e_2 ight)	au^Iarphi W^I_{\mu u}$                         | $^{\mathrm{C}}$                       |
| eW_13   | $\left(ar{\ell}_1\sigma^{\mu u}e_3 ight)	au^Iarphi W^I_{\mu u}$                         | $^{\mathrm{C}}$                       |
| eW_21   | $\left(ar{\ell}_2\sigma^{\mu u}e_1 ight)	au^Iarphi W^I_{\mu u}$                         | $\mathbf{C}$                          |
| eW_22   | $\left(ar{\ell}_2\sigma^{\mu u}e_2 ight)	au^Iarphi W^I_{\mu u}$                         | $\mathbf{C}$                          |
| eW_23   | $\left(ar{\ell}_2\sigma^{\mu u}e_3 ight)	au^Iarphi W^I_{\mu u}$                         | $\mathbf{C}$                          |
| eW_31   | $\left(\underline{\ell}_3\sigma^{\mu u}e_1 ight)	au^Iarphi W^I_{\mu u}$                 | $\mathbf{C}$                          |
| eW_32   | $\left(ar{\ell}_3\sigma^{\mu u}e_2 ight)	au^Iarphi W^I_{\mu u}$                         | $^{\mathrm{C}}$                       |
| eW_33   | $\left(ar{\ell}_3\sigma^{\mu u}e_3 ight)	au^Iarphi W^I_{\mu u}$                         | $^{\mathrm{C}}$                       |
| eB_11   | $\left(ar{\ell}_1\sigma^{\mu u}e_1 ight)arphi B_{\mu u}$                                | $^{\mathrm{C}}$                       |
| eB_12   | $\left(ar{\ell}_1\sigma^{\mu u}e_2 ight)arphi B_{\mu u}$                                | $^{\mathrm{C}}$                       |
| eB_13   | $\left(ar{\ell}_1\sigma^{\mu u}e_3 ight)arphi B_{\mu u}$                                | $^{\mathrm{C}}$                       |
| eB_21   | $\left(ar{\ell}_2\sigma^{\mu u}e_1 ight)arphi B_{\mu u}$                                | $^{\mathrm{C}}$                       |
| eB_22   | $(ar{\ell}_2 \sigma^{\mu  u} e_2)  \varphi B_{\mu  u}$                                  | $^{\mathrm{C}}$                       |
| eB_23   | $\left(ar{\ell}_2\sigma^{\mu u}e_3 ight)arphi B_{\mu u}$                                | C                                     |
| eB_31   | $\left(ar{\ell}_3\sigma^{\mu u}e_1 ight)arphi B_{\mu u}$                                | C                                     |
| eB_32   | $\left(\ell_3\sigma^{\mu u}e_2 ight)arphi B_{\mu u}$                                    | $^{\mathrm{C}}$                       |
| eB_33   | $\left(ar{\ell}_3\sigma^{\mu u}e_3 ight)arphi B_{\mu u}$                                | $^{\mathrm{C}}$                       |
| uG_11   | $(\bar{q}_1\sigma^{\mu u}T^Au_1)\widetilde{arphi}G^A_{\mu u}$                           | $^{\mathrm{C}}$                       |
| uG_12   | $(\bar{q}_1\sigma^{\mu\nu}T^Au_2)\widetilde{\varphi}G^A_{\mu\nu}$                       | $^{\mathrm{C}}$                       |
| uG_13   | $(\bar{q}_1\sigma^{\mu\nu}T^Au_3)\widetilde{\widetilde{\varphi}}G^A_{\mu\nu}$           | $^{\mathrm{C}}$                       |
|         | •   |                                       |

| WC name | Operator   | Type                       |
|---------|--|----------------------------|
| uG_21   | $\left(\bar{q}_2\sigma^{\mu\nu}T^Au_1\right)\widetilde{\varphi}G^A_{\mu\nu}$                             | С                          |
| uG_22   | $\left\langle ar{q}_2 \sigma^{\mu  u} T^A u_2 \right angle \widetilde{arphi} G^{\widetilde{A}}_{\mu  u}$ | $\mathbf{C}$               |
| uG_23   | $\left( ar{q}_2 \sigma^{\mu  u} T^A u_3 \right) \widetilde{arphi} G^A_{\mu  u}$                          | $\mathbf{C}$               |
| uG_31   | $(\bar{q}_3\sigma^{\mu\nu}T^Au_1)\widetilde{\varphi}G^A_{\mu\nu}$  | C                          |
| uG_32   | $(\bar{q}_3\sigma^{\mu u}T^Au_2)\widetilde{\varphi}G_{\mu u}^{\widetilde{A}}$                            | $\mathbf{C}$               |
| uG_33   | $\left\langle ar{q}_{3}\sigma^{\mu u}T^{A}u_{3} ight angle \widetilde{arphi}G_{\mu u}^{\widetilde{A}}$   | $^{\mathrm{C}}$            |
| uW_11   | $(ar{q}_1\sigma^{\mu u}u_1)	au^I\widetilde{arphi}W^I_{\mu u}$  | C                          |
| uW_12   | $(ar{q}_1\sigma^{\mu u}u_2)	au^I\widetilde{arphi}W^I_{\mu u}$  | $^{\mathrm{C}}$            |
| uW_13   | $(ar{q}_1\sigma^{\mu u}u_3)	au^I\widetilde{arphi}W^I_{\mu u}$  | $^{\mathrm{C}}$            |
| uW_21   | $(ar{q}_2\sigma^{\mu u}u_1)	au^I\widetilde{arphi}W^I_{\mu u}$  | $^{\mathrm{C}}$            |
| uW_22   | $(ar{q}_2\sigma^{\mu u}u_2)	au^I\widetilde{arphi}W^I_{\mu u}$  | $^{\mathrm{C}}$            |
| uW_23   | $(ar{q}_2\sigma^{\mu u}u_3)	au^I_{\ ec{arphi}}W^I_{\mu u}$   | $\mathbf{C}$               |
| uW_31   | $(ar{q}_3\sigma^{\mu u}u_1)	au^I_{\ ec{arphi}}W^I_{\mu u}$   | $\mathbf{C}$               |
| uW_32   | $(ar{q}_3\sigma^{\mu u}u_2)	au^I_{\ ec{arphi}}\widetilde{arphi}W^I_{\mu u}$                              | $\mathbf{C}$               |
| uW_33   | $(ar{q}_3\sigma^{\mu u}u_3)	au^I\widetilde{arphi}W^I_{\mu u}$  | $\mathbf{C}$               |
| uB_11   | $(ar{q}_1\sigma^{\mu u}u_1)\widetilde{arphi}B_{\mu u}$   | $\mathbf{C}$               |
| uB_12   | $(\bar{q}_1 \sigma^{\mu \nu} u_2)  \widetilde{\varphi} B_{\mu \nu}$                                      | C                          |
| uB_13   | $(\bar{q}_1\sigma^{\mu\nu}u_3)\widetilde{\varphi}B_{\mu\nu}$   | C                          |
| uB_21   | $(\bar{q}_2\sigma^{\mu\nu}u_1)\widetilde{\varphi}B_{\mu\nu}$   | $\stackrel{	ext{C}}{\sim}$ |
| uB_22   | $(\bar{q}_2\sigma^{\mu\nu}u_2)\widetilde{\varphi}B_{\mu\nu}$   | $\stackrel{	ext{C}}{\sim}$ |
| uB_23   | $(\bar{q}_2\sigma^{\mu u}u_3)\widetilde{arphi}B_{\mu u}$   | C                          |
| uB_31   | $(\bar{q}_3\sigma^{\mu\nu}u_1)\widetilde{\varphi}B_{\mu\nu}$   | C                          |
| uB_32   | $(\bar{q}_3\sigma^{\mu\nu}u_2)\widetilde{\varphi}B_{\mu\nu}$   | C                          |
| uB_33   | $(\bar{q}_3\sigma^{\mu\nu}u_3)\widetilde{\varphi}B_{\mu\nu}$   | C                          |
| dG_11   | $\left(\bar{q}_1\sigma^{\mu\nu}T^Ad_1\right)\varphi G^A_{\mu\nu}$  | C                          |
| dG_12   | $\left(\bar{q}_1\sigma^{\mu\nu}T^Ad_2\right)\varphi G^A_{\mu\nu}$  | C                          |
| dG_13   | $(\bar{q}_1\sigma^{\mu\nu}T^Ad_3)\varphi G^A_{\mu\nu}$   | C                          |
| dG_21   | $\left(\bar{q}_2\sigma^{\mu\nu}T^Ad_1\right)\varphi G^A_{\mu\nu}$  | C                          |
| dG_22   | $\left(\bar{q}_2\sigma^{\mu\nu}T^Ad_2\right)\varphi G^A_{\mu\nu}$  | C                          |
| dG_23   | $\left(\bar{q}_2\sigma^{\mu\nu}T^Ad_3\right)\varphi G^A_{\mu\nu}$  | C                          |
| dG_31   | $(\bar{q}_3\sigma^{\mu\nu}T^Ad_1)\varphi G^A_{\mu\nu}$   | C                          |
| dG_32   | $\left(\bar{q}_{3}\sigma^{\mu\nu}T^{A}d_{2}\right)\varphi G_{\mu\nu}^{A}$                                | C                          |
| dG_33   | $\left(\bar{q}_{3}\sigma^{\mu\nu}T^{A}d_{3}\right)\varphi G_{\mu\nu}^{A}$                                | C                          |
| dW_11   | $(\bar{q}_1\sigma^{\mu\nu}d_1)\tau^I\varphi W^I_{\mu\nu}$  | C<br>C                     |
| dW_12   | $(\bar{q}_1\sigma^{\mu\nu}d_2)\tau^I\varphi W^I_{\mu\nu}$  |                            |
| dW_13   | $(\bar{q}_1\sigma^{\mu\nu}d_3)\tau^I\varphi W^I_{\mu\nu}$  | C                          |
| dW_21   | $(\bar{q}_2\sigma^{\mu\nu}d_1)\tau^I\varphi\dot{W}^I_{\mu\nu}$   | C<br>C                     |
| dW_22   | $(\bar{q}_2\sigma^{\mu\nu}d_2)\tau^I\varphi W^I_{\mu\nu}$  |                            |
| dW_23   | $(\bar{q}_2\sigma^{\mu\nu}d_3)\tau^I\varphi\dot{W}^I_{\mu\nu}$   | C                          |
| dW_31   | $(\bar{q}_3\sigma^{\mu\nu}d_1)\tau^I\varphi\dot{W}^I_{\mu\nu}$   | C                          |
| dW_32   | $(\bar{q}_3\sigma^{\mu\nu}d_2)\tau^I\varphi\dot{W}^I_{\mu\nu}$   | C                          |
| dW_33   | $(\bar{q}_3\sigma^{\mu\nu}d_3)\tau^I\varphi\dot{W}^I_{\mu\nu}$   | C                          |
| dB_11   | $(ar{q}_1\sigma^{\mu u}d_1)arphi B_{\mu u}$  | $^{\mathrm{C}}$            |

| C name       | Operator  | Type                          |
|--------------|---|-------------------------------|
| 3_12         | $(ar{q}_1\sigma^{\mu u}d_2)arphi B_{\mu u}$   | $\mathbf{C}$                  |
| 3_13         | $(\bar{q}_1 \sigma^{\mu\nu} d_3) \varphi B_{\mu\nu}$  | C                             |
| 3_21         | $(\bar{q}_2\sigma^{\mu\nu}d_1)\varphi B_{\mu\nu}$   | C                             |
| 3_22<br>3_23 | $egin{aligned} (ar q_2 \sigma^{\mu u} d_2)  arphi B_{\mu u} \ (ar q_2 \sigma^{\mu u} d_3)  arphi B_{\mu u} \end{aligned}$   | C<br>C                        |
| 5_23<br>3_31 | $(q_2\sigma^{\prime}  a_3) \varphi B_{\mu\nu} \ (\bar{q}_3\sigma^{\mu\nu}d_1) \varphi B_{\mu\nu}$   | C                             |
| 3_32         | $(q_3\sigma^{\mu\nu})\varphi B_{\mu\nu} \ (\bar{q}_3\sigma^{\mu\nu}d_2)\varphi B_{\mu\nu}$  | C                             |
| 3_33         | $(\bar{q}_3\sigma^{\mu u}d_3)arphi B_{\mu u}$   | $\overset{\circ}{\mathrm{C}}$ |
| il1_11       | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) \left(ar{\ell}_1 \gamma^\mu \ell_1 ight)$   | ${ m R}$                      |
| nil1_12      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) \left(ar{\ell}_1 \gamma^\mu \ell_2 ight)$   | $\mathbf{C}$                  |
| nil1_13      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi  ight) \left(ar{\ell}_1 \gamma^\mu \ell_3  ight)$   | $\mathbf{C}$                  |
| nil1_22      | $\left\langle arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi  ight angle \left( ar{\ell}_2 \gamma^\mu \ell_2  ight)$  | R                             |
| nil1_23      | $\left\langle arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi  ight angle \left( ar{\ell}_2 \gamma^\mu \ell_3  ight)$  | C                             |
| nil1_33      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) \left(ar{\ell}_3 \gamma^\mu \ell_3 ight)$   | R                             |
| ni13_11      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{\ell}_1 	au^I \gamma^\mu \ell_1 ight)$   | R                             |
| ni13_12      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{\ell}_1 	au^I \gamma^\mu \ell_2 ight)$   | $\mathbf{C}$                  |
| ni13_13      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{\ell}_1 	au^I \gamma^\mu \ell_3 ight)$   | $\mathbf{C}$                  |
| ni13_22      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{\ell}_2 	au^I \gamma^\mu \ell_2 ight)$   | R                             |
| ni13_23      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{\ell}_2 	au^I \gamma^\mu \ell_3 ight)$   | $\mathbf{C}$                  |
| ni13_33      | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{\ell}_3 	au^I \gamma^\mu \ell_3 ight)$   | R                             |
| nie_11       | $\left( arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi  ight) (ar{e}_1 \gamma^\mu e_1)$   | R                             |
| nie_12       | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) (ar{e}_1 \gamma^\mu e_2)$   | $\mathbf{C}$                  |
| nie_13       | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi  ight) (ar{e}_1 \gamma^\mu e_3)$  | $\mathbf{C}$                  |
| nie_22       | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) (ar{e}_2 \gamma^\mu e_2)$   | ${ m R}$                      |
| nie_23       | $ \begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \end{pmatrix}(\bar{e}_{1}\gamma^{\mu}e_{2}) $ $ \begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \end{pmatrix}(\bar{e}_{2}\gamma^{\mu}e_{2}) $ $ \begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \end{pmatrix}(\bar{e}_{2}\gamma^{\mu}e_{3}) $ $ \begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \\ \end{pmatrix}(\bar{e}_{3}\gamma^{\mu}e_{3}) $ | $\mathbf{C}$                  |
| nie_33       | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi  ight) (ar{e}_3 \gamma^\mu e_3)$  | R                             |

| VC name | Operator   | Type            |
|---------|--|-----------------|
| hiq1_11 | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) (ar{q}_1 \gamma^\mu q_1)$  | R               |
| hiq1_12 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)(ar{q}_{1}\gamma^{\mu}q_{2})$  | $\mathbf{C}$    |
| hiq1_13 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)\left(ar{q}_{1}\gamma^{\mu}q_{3} ight)$  | $\mathbf{C}$    |
| hiq1_22 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)\left(ar{q}_{2}\gamma^{\mu}q_{2} ight)$  | R               |
| hiq1_23 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)\left(ar{q}_{2}\gamma^{\mu}q_{3} ight)$  | $^{\mathrm{C}}$ |
| hiq1_33 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)\left(ar{q}_{3}\gamma^{\mu}q_{3} ight)$  | R               |
| hiq3_11 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}Imuarphi ight)\left(ar{q}_{1}	au^{I}\gamma^{\mu}q_{1} ight)$  | R               |
| hiq3_12 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}Imuarphi ight)\left(ar{q}_{1}	au^{I}\gamma^{\mu}q_{2} ight)$  | $^{\mathrm{C}}$ |
| hiq3_13 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}Imuarphi ight)\left(ar{q}_{1}	au^{I}\gamma^{\mu}q_{3} ight)$  | $\mathbf{C}$    |
| hiq3_22 | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{q}_2 	au^I \gamma^\mu q_2 ight)$  | R               |
| hiq3_23 | $\left(arphi^\dagger i \overset{\leftrightarrow}{D} I m u arphi ight) \left(ar{q}_2 	au^I \gamma^\mu q_3 ight)$  | $^{\mathrm{C}}$ |
| hiq3_33 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}Imuarphi ight)\left(ar{q}_{3}	au^{I}\gamma^{\mu}q_{3} ight)$  | R               |
| hiu_11  | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)(ar{u}_{1}\gamma^{\mu}u_{1})$  | R               |
| hiu_12  | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)(ar{u}_{1}\gamma^{\mu}u_{2})$  | $^{\mathrm{C}}$ |
| hiu_13  | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)(ar{u}_{1}\gamma^{\mu}u_{3})$  | $^{\mathrm{C}}$ |
| hiu_22  | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)(ar{u}_{2}\gamma^{\mu}u_{2})$  | R               |
| ohiu_23 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)(ar{u}_{2}\gamma^{\mu}u_{3})$  | $\mathbf{C}$    |
| ohiu_33 | $\left(arphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}arphi ight)(ar{u}_{3}\gamma^{\mu}u_{3})$  | R               |
| hid_11  | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) \left(ar{d}_1 \gamma^\mu d_1 ight)$  | R               |
| hid_12  | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) \left(ar{d}_1 \gamma^\mu d_2 ight)$  | $\mathbf{C}$    |
| hid_13  | $\begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \end{pmatrix} (\bar{u}_{3}\gamma^{\mu}u_{3})$ $\begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \end{pmatrix} (\bar{d}_{1}\gamma^{\mu}d_{1})$ $\begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \end{pmatrix} (\bar{d}_{1}\gamma^{\mu}d_{2})$ $\begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \end{pmatrix} (\bar{d}_{1}\gamma^{\mu}d_{3})$ $\begin{pmatrix} \varphi^{\dagger}i\overset{\leftrightarrow}{D}_{\mu}\varphi \end{pmatrix} (\bar{d}_{2}\gamma^{\mu}d_{2})$ | $\mathbf{C}$    |
| hid_22  | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) \left(ar{d}_2 \gamma^\mu d_2 ight)$  | R               |

| WC name  | Operator  | Type            |
|----------|---|-----------------|
| phid_23  | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi ight) \left(ar{d}_2 \gamma^\mu d_3 ight)$   | C               |
| phid_33  | $\left(arphi^\dagger i \overset{\leftrightarrow}{D}_\mu arphi  ight) \left(ar{d}_3 \gamma^\mu d_3  ight)$ | ${ m R}$        |
| phiud_11 | $\left(\widetilde{\varphi}^{\dagger}iD_{\mu}\varphi\right)'(\bar{u}_{1}\gamma^{\mu}d_{1})$                | $\mathbf{C}$    |
| phiud_12 | $\left(\widetilde{arphi}^{\dagger}iD_{\mu}arphi ight)\left(ar{u}_{1}\gamma^{\mu}d_{2} ight)$              | $^{\mathrm{C}}$ |
| phiud_13 | $\left(\widetilde{arphi}^{\dagger}iD_{\mu}arphi ight)\left(ar{u}_{1}\gamma^{\mu}d_{3} ight)$              | $^{\mathrm{C}}$ |
| phiud_21 | $\left(\widetilde{arphi}^{\dagger}iD_{\mu}arphi ight)\left(ar{u}_{2}\gamma^{\mu}d_{1} ight)$              | $^{\mathrm{C}}$ |
| phiud_22 | $\left(\widetilde{arphi}^{\dagger}iD_{\mu}arphi ight)\left(ar{u}_{2}\gamma^{\mu}d_{2} ight)$              | $^{\mathrm{C}}$ |
| phiud_23 | $\left(\widetilde{arphi}^{\dagger}iD_{\mu}arphi ight)\left(ar{u}_{2}\gamma^{\mu}d_{3} ight)$              | $^{\mathrm{C}}$ |
| phiud_31 | $\left(\widetilde{arphi}^{\dagger}iD_{\mu}arphi ight)\left(ar{u}_{3}\gamma^{\mu}d_{1} ight)$              | $^{\mathrm{C}}$ |
| phiud_32 | $\left(\widetilde{arphi}^{\dagger}iD_{\mu}arphi ight)\left(ar{u}_{3}\gamma^{\mu}d_{2} ight)$              | $^{\mathrm{C}}$ |
| phiud_33 | $\left( ec{arphi}^{\dagger}iD_{\mu}arphi ight) \left( ar{u}_{3}\gamma^{\mu}d_{3} ight)$                   | $^{\mathrm{C}}$ |
| 11_1111  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{\ell}_1\gamma^\mu\ell_1 ight)$                            | R               |
| 11_1112  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{\ell}_1\gamma^\mu\ell_2 ight)$                            | $\mathbf{C}$    |
| 11_1113  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{\ell}_1\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_1122  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{\ell}_2\gamma^\mu\ell_2 ight)$                            | R               |
| 11_1123  | $\left(\ell_{1}\gamma_{\mu}\ell_{1} ight)\left(\ell_{2}\gamma^{\mu}\ell_{3} ight)$                        | $^{\mathrm{C}}$ |
| 11_1133  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{\ell}_3\gamma^\mu\ell_3 ight)$                            | R               |
| 11_1212  | $\left(\ell_1\gamma_\mu\ell_2 ight)\left(\ell_1\gamma^\mu\ell_2 ight)$                                    | $^{\mathrm{C}}$ |
| 11_1213  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{\ell}_1\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_1221  | $\left(\ell_1\gamma_\mu\ell_2 ight)\left(\ell_2\gamma^\mu\ell_1 ight)$                                    | R               |
| 11_1222  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{\ell}_2\gamma^\mu\ell_2 ight)$                            | $^{\mathrm{C}}$ |
| 11_1223  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{\ell}_2\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_1231  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{\ell}_3\gamma^\mu\ell_1 ight)$                            | $^{\mathrm{C}}$ |
| 11_1232  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{\ell}_3\gamma^\mu\ell_2 ight)$                            | $^{\mathrm{C}}$ |
| 11_1233  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{\ell}_3\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_1313  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{\ell}_1\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_1322  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{\ell}_2\gamma^\mu\ell_2 ight)$                            | $^{\mathrm{C}}$ |
| 11_1323  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{\ell}_2\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_1331  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{\ell}_3\gamma^\mu\ell_1 ight)$                            | R               |
| 11_1332  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{\ell}_3\gamma^\mu\ell_2 ight)$                            | $^{\mathrm{C}}$ |
| 11_1333  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{\ell}_3\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_2222  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{\ell}_2\gamma^\mu\ell_2 ight)$                            | R               |
| 11_2223  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{\ell}_2\gamma^\mu\ell_3 ight)$                            | $^{\mathrm{C}}$ |
| 11_2233  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{\ell}_3\gamma^\mu\ell_3 ight)$                            | R               |
| 11_2323  | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{\ell}_2\gamma^\mu\ell_3)$  | C               |
| 11_2332  | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{\ell}_3\gamma^\mu\ell_2)$  | R               |
| 11_2333  | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{\ell}_3\gamma^\mu\ell_3 ight)$                            | C               |
| 11_3333  | $(ar{\ell}_3\gamma_\mu\ell_3)(ar{\ell}_3\gamma^\mu\ell_3)$  | R               |
| qq1_1111 | $(ar{q}_1\gamma_\mu q_1)(ar{q}_1\gamma^\mu q_1)$  | R               |
| qq1_1112 | $\left(\bar{q}_1\gamma_{\mu}q_1\right)\left(\bar{q}_1\gamma^{\mu}q_2\right)$                              | $^{\mathrm{C}}$ |
| qq1_1113 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{q}_1\gamma^{\mu}q_3 ight)$                                    | $^{\mathrm{C}}$ |

| WC name  | Operator  | Тур                                       |
|----------|---|---|
| qq1_1122 | $\left(\bar{q}_1\gamma_{\mu}q_1\right)\left(\bar{q}_2\gamma^{\mu}q_2\right)$  | R   |
| qq1_1123 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{q}_2\gamma^{\mu}q_3 ight)$  | $^{\mathrm{C}}$                           |
| qq1_1133 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{q}_3\gamma^{\mu}q_3 ight)$  | R   |
| qq1_1212 | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{q}_1\gamma^{\mu}q_2 ight)$  | $^{\mathrm{C}}$                           |
| qq1_1213 | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{q}_1\gamma^{\mu}q_3 ight)$  | $^{\mathrm{C}}$                           |
| qq1_1221 | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{q}_2\gamma^{\mu}q_1 ight)$  | R   |
| qq1_1222 | $\left(ar{q}_{1}\gamma_{\mu}q_{2} ight)\left(ar{q}_{2}\gamma^{\mu}q_{2} ight)$  | $\mathbf{C}$                              |
| qq1_1223 | $\left(ar{q}_{1}\gamma_{\mu}q_{2} ight)\left(ar{q}_{2}\gamma^{\mu}q_{3} ight)$  | $\mathbf{C}$                              |
| qq1_1231 | $\left(ar{q}_{1}\gamma_{\mu}q_{2} ight)\left(ar{q}_{3}\gamma^{\mu}q_{1} ight)$  | $\mathbf{C}$                              |
| qq1_1232 | $(ar{q}_1\gamma_\mu q_2)(ar{q}_3\gamma^\mu q_2)$  | $\mathbf{C}$                              |
| qq1_1233 | $(\bar{q}_1\gamma_\mu q_2)(\bar{q}_3\gamma^\mu q_3)$  | $^{\mathrm{C}}$                           |
| qq1_1313 | $(\bar{q}_1\gamma_\mu q_3)(\bar{q}_1\gamma^\mu q_3)$  | $^{\mathrm{C}}$                           |
| qq1_1322 | $(ar{q}_1\gamma_\mu q_3) (ar{q}_2\gamma^\mu q_2)$   | $^{\mathrm{C}}$                           |
| qq1_1323 | $(ar{q}_1\gamma_\mu q_3)(ar{q}_2\gamma^\mu q_3)$  | $\mathbf{C}$                              |
| qq1_1331 | $(\bar{q}_1\gamma_\mu q_3)(\bar{q}_3\gamma^\mu q_1)$  | R   |
| qq1_1332 | $(ar{q}_1\gamma_\mu q_3)(ar{q}_3\gamma^\mu q_2)$  | $^{\mathrm{C}}$                           |
| qq1_1333 | $(ar{q}_1\gamma_\mu q_3)(ar{q}_3\gamma^\mu q_3)$  | $\dot{\mathrm{C}}$                        |
| qq1_2222 | $(ar{q}_2\gamma_\mu q_2)(ar{q}_2\gamma^\mu q_2)$  | R   |
| qq1_2223 | $egin{array}{c} (ar{q}_2\gamma_\mu q_2) \ (ar{q}_2\gamma^\mu q_3) \end{array}$  | C   |
| qq1_2233 | $(ar{q}_2\gamma_\mu q_2) (ar{q}_3\gamma^\mu q_3) \ (ar{q}_3\gamma^\mu q_3)$   | R   |
| qq1_2323 | $(ar{q}_2\gamma_\mu q_3) (ar{q}_3\gamma^\mu q_3) \ (ar{q}_2\gamma^\mu q_3)$   | C   |
| qq1_2332 | $(ar{q}_2\gamma_\mu q_3) (ar{q}_3\gamma^\mu q_2) \ $  | R   |
| qq1_2333 | $(ar{q}_2\gamma_\mu q_3) (ar{q}_3\gamma^\mu q_3) \ (ar{q}_3\gamma^\mu q_3)$   | C   |
| qq1_3333 | $(ar{q}_3\gamma_\mu q_3)(ar{q}_3\gamma^\mu q_3)$  | R   |
| qq3_1111 | $\left(ar{q}_1\gamma_{\mu}\tau^Iq_1 ight)\left(ar{q}_1\gamma^{\mu}	au^Iq_1 ight)$   | R   |
| qq3_1112 | $egin{pmatrix} (q_1)'\mu' & q_1' & q_1' \\ (ar q_1\gamma_\mu	au^Iq_1) & (ar q_1\gamma^\mu	au^Iq_2) \end{pmatrix}$   | C   |
| qq3_1113 | $egin{pmatrix} (q_1)'\mu' & q_1' & q_2' \ (ar q_1\gamma_\mu	au^Iq_1) & (ar q_1\gamma^\mu	au^Iq_3) \end{pmatrix}$  | $\overset{\circ}{\mathrm{C}}$             |
| qq3_1122 | $egin{pmatrix} (q_1)'\mu' & q_1\rangle & (q_1)'\mu' & q_3\rangle \ (ar q_1\gamma_\mu	au^Iq_1) & (ar q_2\gamma^\mu	au^Iq_2) \end{pmatrix}$                   | $\stackrel{\circ}{ m R}$                  |
| qq3_1123 | $egin{pmatrix} (q_1)''' & q_1' & q_2' & q_2' \ (ar q_1 \gamma_\mu 	au^I q_1) & (ar q_2 \gamma^\mu 	au^I q_3) \end{pmatrix}$                                 | C   |
| qq3_1133 | $egin{pmatrix} (q_1)''' & q_1 \end{pmatrix} (q_2)'' & q_3 \end{pmatrix} \ ig(ar{q}_1\gamma_\mu	au^Iq_1ig) & ig(ar{q}_3\gamma^\mu	au^Iq_3ig) \end{pmatrix}$  | $\overset{\circlearrowright}{\mathrm{R}}$ |
| qq3_1212 | $egin{pmatrix} (q_1)_\mu & q_1 \end{pmatrix} (q_3)_\mu & q_3 \end{pmatrix} \ \left(ar{q}_1\gamma_\mu	au^Iq_2 ight) \left(ar{q}_1\gamma^\mu	au^Iq_2 ight)$   | C   |
| qq3_1213 | $egin{pmatrix} (q_1 & \gamma_\mu & q_2) & (q_1 & \gamma^{-1} & q_2) \ ig(ar{q}_1 \gamma_\mu 	au^I q_2) & ig(ar{q}_1 \gamma^\mu 	au^I q_3) \end{pmatrix}$    | $^{\mathrm{C}}_{\mathrm{C}}$              |
| qq3_1221 | $(q_1\gamma_\mu r_1q_2)(q_1\gamma_1 r_1q_3) \ (ar q_1\gamma_\mu 	au^Iq_2)(ar q_2\gamma^\mu 	au^Iq_1)$   | $^{ m C}_{ m R}$                          |
|          |   | $^{ m R}$                                 |
| qq3_1222 |   | C   |
| qq3_1223 | $egin{pmatrix} (ar{q}_1\gamma_\mu	au^Iq_2) & (ar{q}_2\gamma^\mu	au^Iq_3) \ (ar{z}_2\gamma_\mu - I_2\gamma) & (ar{z}_2\gamma_\mu - I_2\gamma) \end{pmatrix}$ |   |
| qq3_1231 | $(ar{q}_1\gamma_\mu	au^Iq_2)(ar{q}_3\gamma^\mu	au^Iq_1)$  | C   |
| qq3_1232 | $\left\langle ar{q}_1 \gamma_\mu 	au^I q_2 \right\rangle \left\langle ar{q}_3 \gamma^\mu 	au^I q_2 \right\rangle$   | C   |
| qq3_1233 | $\left\langle \bar{q}_1 \dot{\gamma}_\mu \tau^I q_2 \right\rangle \left\langle \bar{q}_3 \gamma^\mu \tau^I q_3 \right\rangle$                               | C   |
| qq3_1313 | $\langle \bar{q}_1 \gamma_\mu \tau^I q_3 \rangle \langle \bar{q}_1 \gamma^\mu \tau^I q_3 \rangle$   | C   |
| qq3_1322 | $\left(ar{q}_1\gamma_\mu	au^Iq_3 ight)\left(ar{q}_2\gamma^\mu	au^Iq_2 ight)$  | C   |
| qq3_1323 | $\left( ar{q}_1 \gamma_\mu 	au^I_{q} q_3 \right) \left( ar{q}_2 \gamma^\mu 	au^I_{q} q_3 \right)$   | С   |
| qq3_1331 | $\left( \bar{q}_1 \gamma_\mu \tau^I_{q_3} \right) \left( \bar{q}_3 \gamma^\mu \tau^I_{q_1} \right)$   | R   |
| qq3_1332 | $\left(ar{q}_1\gamma_\mu	au^I_{q}q_3 ight)\left(ar{q}_3\gamma^\mu	au^I_{q}q_2 ight)$  | C   |
| qq3_1333 | $\left(ar{q}_1\gamma_\mu	au^Iq_3 ight)\left(ar{q}_3\gamma^\mu	au^Iq_3 ight)$  | C   |

| WC name  | Operator  | Type            |
|----------|---|-----------------|
|          |   | Туре            |
| qq3_2222 | $\left(ar{q}_2\gamma_\mu	au^Iq_2 ight)\left(ar{q}_2\gamma^\mu	au^Iq_2 ight)$                                  | R               |
| qq3_2223 | $\left(ar{q}_2\gamma_\mu	au^Iq_2 ight)\left(ar{q}_2\gamma^\mu	au^Iq_3 ight)$                                  | С               |
| qq3_2233 | $\left( ar{q}_2 \gamma_\mu 	au^I q_2 \right) \left( ar{q}_3 \gamma^\mu 	au^I q_3 \right)$                     | R               |
| qq3_2323 | $\left( ar{q}_2 \gamma_\mu 	au^I_{} q_3 \right) \left( ar{q}_2 \gamma^\mu 	au^I_{} q_3 \right)$               | С               |
| qq3_2332 | $\left( ar{q}_2 \gamma_\mu 	au^I_{} q_3 \right) \left( ar{q}_3 \gamma^\mu 	au^I_{} q_2 \right)$               | R               |
| qq3_2333 | $\left(ar{q}_2\gamma_\mu	au^Iq_3 ight)\left(ar{q}_3\gamma^\mu	au^Iq_3 ight)$                                  | С               |
| qq3_3333 | $\left(ar{q}_3\gamma_\mu	au^Iq_3 ight)\left(ar{q}_3\gamma^\mu	au^Iq_3 ight)$                                  | R               |
| lq1_1111 | $\left(\ell_1\gamma_\mu\ell_1 ight)\left(ar{q}_1\gamma^\mu q_1 ight)$   | R               |
| lq1_1112 | $\left(\ell_{1}\gamma_{\mu}\ell_{1} ight)\left(ar{q}_{1}\gamma^{\mu}q_{2} ight)$                              | С               |
| lq1_1113 | $\left(\ell_{1}\gamma_{\mu}\ell_{1} ight)\left(ar{q}_{1}\gamma^{\mu}q_{3} ight)$                              | С               |
| lq1_1122 | $\left( ar{\ell}_1 \gamma_\mu \ell_1  ight) \left( ar{q}_2 \gamma^\mu q_2  ight)$                             | $\mathbf{R}$    |
| lq1_1123 | $\left( ar{\ell}_1 \gamma_\mu \ell_1 \right) \left( ar{q}_2 \gamma^\mu q_3  ight)$                            | $\mathbf{C}$    |
| lq1_1133 | $\left( ar{\ell}_1 \gamma_\mu \ell_1 \right) \left( ar{q}_3 \gamma^\mu q_3 \right)$                           | R               |
| lq1_1211 | $\left( \ell_1 \gamma_\mu \ell_2  ight) \left( ar{q}_1 \gamma^\mu q_1  ight)$                                 | $^{\mathrm{C}}$ |
| lq1_1212 | $\left(\ell_1\gamma_\mu\ell_2 ight)\left(ar{q}_1\gamma^\mu q_2 ight)$   | $^{\mathrm{C}}$ |
| lq1_1213 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{q}_1\gamma^\mu q_3 ight)$                                     | $\mathbf{C}$    |
| lq1_1221 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{q}_2\gamma^\mu q_1 ight)$                                     | С               |
| lq1_1222 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{q}_2\gamma^\mu q_2 ight)$                                     | С               |
| lq1_1223 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{q}_2\gamma^\mu q_3 ight)$                                     | $\mathbf{C}$    |
| lq1_1231 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{q}_3\gamma^\mu q_1 ight)$                                     | $\mathbf{C}$    |
| lq1_1232 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{q}_3\gamma^\mu q_2 ight)$                                     | $\mathbf{C}$    |
| lq1_1233 | $(ar{\ell}_1\gamma_\mu\ell_2)(ar{q}_3\gamma^\mu q_3)$   | $\mathbf{C}$    |
| lq1_1311 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{q}_1\gamma^\mu q_1 ight)$                                     | $\mathbf{C}$    |
| lq1_1312 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{q}_1\gamma^\mu q_2 ight)$                                     | $\mathbf{C}$    |
| lq1_1313 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{q}_1\gamma^\mu q_3 ight)$                                     | $\mathbf{C}$    |
| lq1_1321 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{q}_2\gamma^\mu q_1 ight)$                                     | $\mathbf{C}$    |
| lq1_1322 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{q}_2\gamma^\mu q_2 ight)$                                     | $\mathbf{C}$    |
| lq1_1323 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{q}_2\gamma^\mu q_3 ight)$                                     | $\mathbf{C}$    |
| lq1_1331 | $(ar{\ell}_1\gamma_\mu\ell_3)(ar{q}_3\gamma^\mu q_1)$   | $\mathbf{C}$    |
| lq1_1332 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{q}_3\gamma^\mu q_2 ight)$                                     | $\mathbf{C}$    |
| lq1_1333 | $(ar{\ell}_1\gamma_\mu\ell_3)(ar{q}_3\gamma^\mu q_3)$   | $\mathbf{C}$    |
| lq1_2211 | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{q}_1\gamma^\mu q_1 ight)$                                     | $\mathbf{R}$    |
| lq1_2212 | $(ar{\ell}_2\gamma_\mu\ell_2)(ar{q}_1\gamma^\mu q_2)$   | $\mathbf{C}$    |
| lq1_2213 | $(ar{\ell}_2\gamma_\mu\ell_2)(ar{q}_1\gamma^\mu q_3)$   | $\mathbf{C}$    |
| lq1_2222 | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{q}_2\gamma^\mu q_2 ight)$                                     | ${ m R}$        |
| lq1_2223 | $(ar{\ell}_2\gamma_\mu\ell_2)(ar{q}_2\gamma^\mu q_3)$   | $\mathbf{C}$    |
| lq1_2233 | $(ar{\ell}_2\gamma_\mu\ell_2)(ar{q}_3\gamma^\mu q_3)$   | ${ m R}$        |
| lq1_2311 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{q}_1\gamma^\mu q_1)$   | $\mathbf{C}$    |
| lq1_2312 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{q}_1\gamma^\mu q_2)$   | $\mathbf{C}$    |
| lq1_2313 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{q}_1\gamma^\mu q_3) \ $  | $^{\mathrm{C}}$ |
| lq1_2321 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{q}_2\gamma^\mu q_1)$   | $^{\mathrm{C}}$ |
| 1q1_2322 | $(ar\ell_2\gamma_\mu\ell_3) (ar\ell_2\gamma^\mu\ell_2) \ (ar\ell_2\gamma^\mu\ell_3) (ar q_2\gamma^\mu\ell_2)$ | C               |
| 1        | ( 2 1 \mu 3) (12 1 12)  | ~               |

| WC name  | Operator  | Type            |
|----------|---|-----------------|
| 1q1_2323 | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{q}_2\gamma^\mu q_3 ight)$   | C               |
| lq1_2331 | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{q}_3\gamma^\mu q_1 ight)$   | $^{\mathrm{C}}$ |
| lq1_2332 | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{q}_3\gamma^\mu q_2 ight)$   | C               |
| lq1_2333 | $\left(ar{\ell}_2\gamma_{\mu}\ell_3 ight)\left(ar{q}_3\gamma^{\mu}q_3 ight)$  | С               |
| lq1_3311 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{q}_1\gamma^\mu q_1 ight)$   | R               |
| lq1_3312 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{q}_1\gamma^\mu q_2 ight)$   | $^{\mathrm{C}}$ |
| lq1_3313 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{q}_1\gamma^\mu q_3 ight)$   | $^{\mathrm{C}}$ |
| lq1_3322 | $\left(ar{\ell}_3\gamma_{\mu}\ell_3 ight)\left(ar{q}_2\gamma^{\mu}q_2 ight)$  | R               |
| lq1_3323 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{q}_2\gamma^\mu q_3 ight)$   | $^{\mathrm{C}}$ |
| lq1_3333 | $\left(ar{\ell}_3\gamma_{\mu}\ell_3 ight)\left(ar{q}_3\gamma^{\mu}q_3 ight)$  | R               |
| lq3_1111 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_1 ight)\left(ar{q}_1\gamma^\mu	au^Iq_1 ight)$  | R               |
| lq3_1112 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_1 ight)\left(ar{q}_1\gamma^{\mu}	au^Iq_2 ight)$  | С               |
| lq3_1113 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_1 ight)\left(ar{q}_1\gamma^\mu	au^Iq_3 ight)$  | $^{\mathrm{C}}$ |
| lq3_1122 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_1 ight)\left(ar{q}_2\gamma^\mu	au^Iq_2 ight)$  | R               |
| lq3_1123 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_1 ight)\left(ar{q}_2\gamma^{\mu}	au^Iq_3 ight)$  | С               |
| lq3_1133 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_1 ight)\left(ar{q}_3\gamma^{\mu}	au^Iq_3 ight)$  | R               |
| lq3_1211 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_1\gamma^\mu	au^Iq_1 ight)$  | $^{\mathrm{C}}$ |
| lq3_1212 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_1\gamma^\mu	au^Iq_2 ight)$  | $^{\mathrm{C}}$ |
| lq3_1213 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_1\gamma^\mu	au^Iq_3 ight)$  | $^{\mathrm{C}}$ |
| lq3_1221 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_2\gamma^\mu	au^Iq_1 ight)$  | $\mathbf{C}$    |
| 1q3_1222 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_2 ight)\left(ar{q}_2\gamma^{\mu}	au^Iq_2 ight)$  | $\mathbf{C}$    |
| lq3_1223 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_2 ight)\left(ar{q}_2\gamma^{\mu}	au^Iq_3 ight)$  | $^{\mathrm{C}}$ |
| lq3_1231 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_2 ight)\left(ar{q}_3\gamma^{\mu}	au^Iq_1 ight)$  | $^{\mathrm{C}}$ |
| lq3_1232 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_2 ight)\left(ar{q}_3\gamma^{\mu}	au^Iq_2 ight)$  | $\mathbf{C}$    |
| lq3_1233 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_2 ight)\left(ar{q}_3\gamma^{\mu}	au^Iq_3 ight)$  | $\mathbf{C}$    |
| lq3_1311 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_3 ight)\left(ar{q}_1\gamma^\mu	au^Iq_1 ight)$  | $\mathbf{C}$    |
| lq3_1312 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_3 ight)\left(ar{q}_1\gamma^\mu	au^Iq_2 ight)$  | $\mathbf{C}$    |
| lq3_1313 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_3 ight)\left(ar{q}_1\gamma^\mu	au^Iq_3 ight)$  | $^{\mathrm{C}}$ |
| lq3_1321 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_3 ight)\left(ar{q}_2\gamma^{\mu}	au^Iq_1 ight)$  | $^{\mathrm{C}}$ |
| lq3_1322 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_3 ight)\left(ar{q}_2\gamma^\mu	au^Iq_2 ight)$  | $\mathbf{C}$    |
| lq3_1323 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_3 ight)\left(ar{q}_2\gamma^{\mu}	au^Iq_3 ight)$  | $\mathbf{C}$    |
| lq3_1331 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_3 ight)\left(ar{q}_3\gamma^\mu	au^Iq_1 ight)$  | $\mathbf{C}$    |
| 1q3_1332 | $\left(ar{\ell}_1\gamma_{\mu}	au^I\ell_3 ight)\left(ar{q}_3\gamma^{\mu}	au^Iq_2 ight)$  | С               |
| lq3_1333 | $\left(ar{\ell}_1\gamma_\mu	au^I\ell_3 ight)\left(ar{q}_3\gamma^\mu	au^Iq_3 ight)$  | $\mathbf{C}$    |
| lq3_2211 | $\left(ar{\ell}_2\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_1\gamma^\mu	au^Iq_1 ight)$  | R               |
| 1q3_2212 | $\left(ar{\ell}_2\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_1\gamma^\mu	au^Iq_2 ight)$  | $^{\mathrm{C}}$ |
| 1q3_2213 | $\left(ar{\ell}_2\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_1\gamma^\mu	au^I_{}q_3 ight)$   | $\mathbf{C}$    |
| 1q3_2222 | $\left(ar{\ell}_2\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_2\gamma^\mu	au^Iq_2 ight)$  | R               |
| 1q3_2223 | $\left(ar{\ell}_2\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_2\gamma^\mu	au^Iq_3 ight)$  | $\mathbf{C}$    |
| 1q3_2233 | $\left(ar{\ell}_2\gamma_\mu	au^I\ell_2 ight)\left(ar{q}_3\gamma^\mu	au^Iq_3 ight)$  | R               |
| lq3_2311 | $\begin{array}{c} (\bar{\ell}_{2}\gamma_{\mu}\tau^{I}\ell_{2}) \ (\bar{q}_{1}\gamma^{\mu}\tau^{I}q_{2}) \\ (\bar{\ell}_{2}\gamma_{\mu}\tau^{I}\ell_{2}) \ (\bar{q}_{2}\gamma^{\mu}\tau^{I}q_{2}) \\ (\bar{\ell}_{2}\gamma_{\mu}\tau^{I}\ell_{2}) \ (\bar{q}_{2}\gamma^{\mu}\tau^{I}q_{3}) \\ (\bar{\ell}_{2}\gamma_{\mu}\tau^{I}\ell_{2}) \ (\bar{q}_{3}\gamma^{\mu}\tau^{I}q_{3}) \\ (\bar{\ell}_{2}\gamma_{\mu}\tau^{I}\ell_{3}) \ (\bar{q}_{1}\gamma^{\mu}\tau^{I}q_{1}) \\ (\bar{\ell}_{2}\gamma_{\mu}\tau^{I}\ell_{3}) \ (\bar{q}_{1}\gamma^{\mu}\tau^{I}q_{2}) \end{array}$ | $\mathbf{C}$    |
| lq3_2312 | $\left(\ell_2\gamma_\mu	au^I\ell_3 ight)\left(ar{q}_1\gamma^\mu	au^Iq_2 ight)$  | $^{\mathrm{C}}$ |

| WC name            | Operator   | Type                               |
|--------------------|--|------------------------------------|
| 1q3_2313           | $(\bar{\ell}_2\gamma_\mu	au^I\ell_3)(\bar{q}_1\gamma^\mu	au^Iq_3)$   | C                                  |
| 1q3_2321           | $(ar{\ell}_2\gamma_\mu	au^I\ell_3)(ar{q}_2\gamma^\mu	au^Iq_1)$   | $^{\mathrm{C}}$                    |
| 1q3_2322           | $(ar{\ell}_2\gamma_\mu	au^I\ell_3)(ar{q}_2\gamma^\mu	au^Iq_2)$   | $^{\mathrm{C}}$                    |
| 1q3_2323           | $(ar{\ell}_2\gamma_\mu	au^I\ell_3)(ar{q}_2\gamma^\mu	au^Iq_3)$   | $^{\mathrm{C}}$                    |
| 1q3_2331           | $(ar{\ell}_2\gamma_\mu	au^I\ell_3)(ar{q}_3\gamma^\mu	au^Iq_1)$   | $^{\mathrm{C}}$                    |
| 1q3_2332           | $(ar{\ell}_2\gamma_\mu	au^I\ell_3)(ar{q}_3\gamma^\mu	au^Iq_2)$   | $^{\mathrm{C}}$                    |
| 1q3_2333           | $(ar{\ell}_2\gamma_\mu	au^I\ell_3)(ar{q}_3\gamma^\mu	au^Iq_3)$   | $^{\mathrm{C}}$                    |
| 1q3_3311           | $(ar{\ell}_3\gamma_\mu	au^I\ell_3)(ar{q}_1\gamma^\mu	au^Iq_1)$   | ${ m R}$                           |
| 1q3_3312           | $(ar{\ell}_3\gamma_\mu	au^I\ell_3)(ar{q}_1\gamma^\mu	au^Iq_2)$   | $^{\mathrm{C}}$                    |
| 1q3_3313           | $(ar{\ell}_3\gamma_\mu	au^I\ell_3)(ar{q}_1\gamma^\mu	au^Iq_3)$   | $^{\mathrm{C}}$                    |
| 1q3_3322           | $(ar{\ell}_3\gamma_\mu	au^I\ell_3)(ar{q}_2\gamma^\mu	au^Iq_2)$   | ${ m R}$                           |
| 1q3_3323           | $(ar{\ell}_3\gamma_\mu	au^I\ell_3)(ar{q}_2\gamma^\mu	au^Iq_3)$   | $^{\mathrm{C}}$                    |
| 1q3_3333           | $(ar{\ell}_3\gamma_\mu	au^I\ell_3)(ar{q}_3\gamma^\mu	au^Iq_3)$   | ${ m R}$                           |
| ee_1111            | $(\bar{e}_1\gamma_\mu e_1)(\bar{e}_1\gamma^\mu e_1)$   | R                                  |
| ee_1112            | $(ar{e}_1\gamma_\mu e_1)(ar{e}_1\gamma^\mu e_2)$   | $^{\mathrm{C}}$                    |
| ee_1113            | $(ar{e}_1\gamma_\mu e_1)(ar{e}_1\gamma^\mu e_3)$   | $^{\mathrm{C}}$                    |
| ee_1122            | $\left(ar{e}_1\gamma_{\mu}e_1 ight)\left(ar{e}_2\gamma^{\mu}e_2 ight)$   | ${ m R}$                           |
| ee_1123            | $\left(ar{e}_1\gamma_{\mu}e_1 ight)\left(ar{e}_2\gamma^{\mu}e_3 ight)$   | $^{\mathrm{C}}$                    |
| ee_1133            | $\left(ar{e}_1\gamma_{\mu}e_1 ight)\left(ar{e}_3\gamma^{\mu}e_3 ight)$   | R                                  |
| ee_1212            | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{e}_1\gamma^{\mu}e_2 ight)$   | $^{\mathrm{C}}$                    |
| ee_1213            | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{e}_1\gamma^{\mu}e_3 ight)$   | C                                  |
| ee_1222            | $(ar{e}_1\gamma_{\mu}e_2)(ar{e}_2\gamma^{\mu}e_2)$   | C                                  |
| ee_1223            | $(ar{e}_1\gamma_{\mu}e_2)(ar{e}_2\gamma^{\mu}e_3)$   | C                                  |
| ee_1232            | $(\bar{e}_1\gamma_\mu e_2)(\bar{e}_3\gamma^\mu e_2)$   | C                                  |
| ee_1233            | $(\bar{e}_1\gamma_\mu e_2)(\bar{e}_3\gamma^\mu e_3)$   | С                                  |
| ee_1313            | $(\bar{e}_1\gamma_\mu e_3)(\bar{e}_1\gamma^\mu e_3)$   | С                                  |
| ee_1323            | $(\bar{e}_1\gamma_\mu e_3)(\bar{e}_2\gamma^\mu e_3)$   | С                                  |
| ee_1333            | $(\bar{e}_1\gamma_\mu e_3)(\bar{e}_3\gamma^\mu e_3)$   | С                                  |
| ee_2222            | $(ar{e}_2\gamma_\mu e_2)(ar{e}_2\gamma^\mu e_2)$   | R                                  |
| ee_2223            | $(ar{e}_2\gamma_\mu e_2)(ar{e}_2\gamma^\mu e_3)$   | C<br>R                             |
| ee_2233<br>ee_2323 | $(ar{e}_2\gamma_\mu e_2)(ar{e}_3\gamma^\mu e_3) \ (ar{e}_3\gamma^\mu e_3) \ (ar{e}_3\gamma^\mu e_3) \ (ar{e}_3\gamma^\mu e_3)$               | $\overset{\mathbf{R}}{\mathrm{C}}$ |
| ee_2323<br>ee_2333 | $egin{array}{l} (ar{e}_2 \gamma_{\mu} e_3)  (ar{e}_2 \gamma^{\mu} e_3) \ (ar{e}_2 \gamma_{\mu} e_3)  (ar{e}_3 \gamma^{\mu} e_3) \end{array}$ | C                                  |
| ee_3333            | $(ar{e}_2\gamma_\mu e_3)(ar{e}_3\gamma^\mu e_3) \ (ar{e}_3\gamma_\mu e_3)(ar{e}_3\gamma^\mu e_3)$  | R                                  |
| uu_1111            | $(\bar{u}_1\gamma_\mu u_1)(\bar{u}_1\gamma^\mu u_1)$   | R                                  |
| uu_1112            | $(\bar{u}_1\gamma_\mu u_1)(\bar{u}_1\gamma^\mu u_1)  (\bar{u}_1\gamma_\mu u_1)(\bar{u}_1\gamma^\mu u_2)$                                     | C                                  |
| uu_1113            | $(\bar{u}_1\gamma_\mu u_1)(\bar{u}_1\gamma^\mu u_2) \ (\bar{u}_1\gamma_\mu u_1)(\bar{u}_1\gamma^\mu u_3)$                                    | $\overset{\circ}{\mathrm{C}}$      |
| uu_1122            | $(\bar{u}_1\gamma_\mu u_1)(\bar{u}_1\gamma^\mu u_2)$   | R                                  |
| uu_1123            | $(\bar{u}_1\gamma_\mu u_1)(\bar{u}_2\gamma^\mu u_3)$   | C                                  |
| uu_1133            | $(\bar{u}_1\gamma_\mu u_1)(\bar{u}_2\gamma^\mu u_3)$   | R                                  |
| uu_1212            | $(\bar{u}_1\gamma_\mu u_1)(\bar{u}_3\gamma^\mu u_3)  (\bar{u}_1\gamma_\mu u_2)(\bar{u}_1\gamma^\mu u_2)$                                     | C                                  |
| uu_1213            | $(\bar{u}_1\gamma_\mu u_2)(\bar{u}_1\gamma^\mu u_3) \ (\bar{u}_1\gamma^\mu u_3)$   | Č                                  |
| _<br>uu_1221       | $(\bar{u}_1 \gamma_\mu u_2) (\bar{u}_2 \gamma^\mu u_1)$  | R                                  |
|                    |  |                                    |

| WC name            | Operator  | Type                               |
|--------------------|---|------------------------------------|
| uu_1222            | $(\bar{u}_1\gamma_\mu u_2)(\bar{u}_2\gamma^\mu u_2)$  | С                                  |
| uu_1223            | $\left(\bar{u}_1\gamma_{\mu}u_2\right)\left(\bar{u}_2\gamma^{\mu}u_3\right)$  | $\mathbf{C}$                       |
| uu_1231            | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{u}_3\gamma^{\mu}u_1 ight)$  | $\mathbf{C}$                       |
| uu_1232            | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{u}_3\gamma^{\mu}u_2 ight)$  | $^{\mathrm{C}}$                    |
| uu_1233            | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$  | $\mathbf{C}$                       |
| uu_1313            | $\left(ar{u}_1\gamma_{\mu}u_3 ight)\left(ar{u}_1\gamma^{\mu}u_3 ight)$  | $\mathbf{C}$                       |
| uu_1322            | $\left(ar{u}_1\gamma_{\mu}u_3 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$  | $\mathbf{C}$                       |
| uu_1323            | $\left(\bar{u}_1\gamma_{\mu}u_3\right)\left(\bar{u}_2\gamma^{\mu}u_3\right)$  | С                                  |
| uu_1331            | $\left(\bar{u}_1\gamma_{\mu}u_3\right)\left(\bar{u}_3\gamma^{\mu}u_1\right)$  | R                                  |
| uu_1332            | $\left(\bar{u}_1\gamma_{\mu}u_3\right)\left(\bar{u}_3\gamma^{\mu}u_2\right)$  | С                                  |
| uu_1333            | $\left(ar{u}_1\gamma_{\mu}u_3 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$  | $\mathbf{C}$                       |
| uu_2222            | $\left(ar{u}_2\gamma_{\mu}u_2 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$  | R                                  |
| uu_2223            | $\left(ar{u}_2\gamma_{\mu}u_2 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$  | С                                  |
| uu_2233            | $\left(ar{u}_2\gamma_{\mu}u_2 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$  | R                                  |
| uu_2323            | $\left(ar{u}_2\gamma_{\mu}u_3 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$  | С                                  |
| uu_2332            | $\left(\bar{u}_2\gamma_{\mu}u_3\right)\left(\bar{u}_3\gamma^{\mu}u_2\right)$  | R                                  |
| uu_2333            | $\left(\bar{u}_2\gamma_{\mu}u_3\right)\left(\bar{u}_3\gamma^{\mu}u_3\right)$  | С                                  |
| uu_3333            | $\left(ar{u}_3\gamma_{\mu}u_3 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$  | R                                  |
| dd_1111            | $\left(ar{d}_1\gamma_{\mu}d_1 ight)\left(ar{d}_1\gamma^{\mu}d_1 ight)$  | R                                  |
| dd_1112            | $\left(ar{d}_1\gamma_{\mu}d_1 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$  | $\mathbf{C}$                       |
| dd_1113            | $\left(ar{d}_1\gamma_{\mu}d_1 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$  | $^{\mathrm{C}}$                    |
| dd_1122            | $\left(ar{d}_1\gamma_{\mu}d_1 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$  | R                                  |
| dd_1123            | $\left(ar{d}_1\gamma_{\mu}d_1 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$  | $^{\mathrm{C}}$                    |
| dd_1133            | $\left(ar{d}_1\gamma_{\mu}d_1 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$  | R                                  |
| dd_1212            | $\left(ar{d}_1\gamma_{\mu}d_2 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$  | $^{\mathrm{C}}$                    |
| dd_1213            | $\left(ar{d}_1\gamma_\mu d_2 ight)\left(ar{d}_1\gamma^\mu d_3 ight)$  | $^{\mathrm{C}}$                    |
| dd_1221            | $\left(ar{d}_1\gamma_\mu d_2 ight)\left(ar{d}_2\gamma^\mu d_1 ight)$  | R                                  |
| dd_1222            | $\left(ar{d}_1\gamma_\mu d_2 ight)\left(ar{d}_2\gamma^\mu d_2 ight)$  | $^{\mathrm{C}}$                    |
| dd_1223            | $\left(ar{d}_1\gamma_\mu d_2 ight)\left(ar{d}_2\gamma^\mu d_3 ight)$  | $^{\mathrm{C}}$                    |
| dd_1231            | $\left(ar{d}_1\gamma_\mu d_2 ight)\left(ar{d}_3\gamma^\mu d_1 ight)$  | C                                  |
| _<br>dd_1232       | $\left(ar{d}_1\gamma_\mu d_2 ight)\left(ar{d}_3\gamma^\mu d_2 ight)$  | $^{\mathrm{C}}$                    |
| dd_1233            | $(ar{d}_1\gamma_\mu d_2)(ar{d}_3\gamma^\mu d_3)$  | C                                  |
| dd_1313            | $(ar{d}_1\gamma_\mu d_3) \ (ar{d}_1\gamma^\mu d_3)$   | C                                  |
| dd_1322            | $(ar{d}_1\gamma_\mu d_3) (ar{d}_2\gamma^\mu d_2)$   | Č                                  |
| dd_1323            | $\left(ar{d}_1\gamma_\mu a_3 ight)\left(ar{d}_2\gamma^\mu d_3 ight) \ \left(ar{d}_1\gamma_\mu d_3 ight)\left(ar{d}_2\gamma^\mu d_3 ight)$         | $\overset{\circ}{\mathrm{C}}$      |
| dd_1331            | $\left(ar{d}_1\gamma_\mu a_3 ight)\left(ar{d}_2\gamma^\mu d_1 ight)$  | R                                  |
| dd_1332            | $egin{pmatrix} (a_1^{\alpha_1}\eta_{\mu}a_3) & (a_3^{\alpha_3}\eta_{\mu}a_1) \ (ar{d}_1\gamma_{\mu}d_3) & (ar{d}_3\gamma^{\mu}d_2) \end{pmatrix}$ | C                                  |
| dd_1333            | $egin{pmatrix} (a_1\ \gamma_\mu a_3)\ (a_3\ \gamma^\mu a_2)\ (ar{d}_1\gamma_\mu d_3)\ (ar{d}_3\gamma^\mu d_3) \end{pmatrix}$                      | C                                  |
| dd_1333<br>dd_2222 | $egin{array}{l} (a_1\gamma_\mu a_3) \ (a_3\gamma^\mu a_3) \ (ar{d}_2\gamma_\mu d_2) \ (ar{d}_2\gamma^\mu d_2) \end{array}$                        | R                                  |
|                    |   | $\overset{\mathbf{R}}{\mathrm{C}}$ |
| dd_2223            | $egin{pmatrix} (ar{d}_2\gamma_\mu d_2) \ (ar{d}_2\gamma^\mu d_3) \ (ar{d}_1\gamma_\mu d_2) \ (ar{d}_2\gamma^\mu d_3) \end{pmatrix}$               |                                    |
| dd_2233            | $(\bar{d}_2\gamma_\mu d_2) (\bar{d}_3\gamma^\mu d_3)$   | R                                  |
| dd_2323            | $(\bar{d}_2\gamma_\mu d_3)(\bar{d}_2\gamma^\mu d_3)$  | С                                  |
| dd_2332            | $\left(ar{d}_{2}\gamma_{\mu}d_{3} ight)\left(ar{d}_{3}\gamma^{\mu}d_{2} ight)$  | R                                  |

| WC name | Operator   | Type            |
|---------|--|-----------------|
| dd_2333 | $\left(ar{d}_2\gamma_\mu d_3\right)\left(ar{d}_3\gamma^\mu d_3\right)$       | C               |
| dd_3333 | $\left(ar{d}_3\gamma_\mu d_3 ight)\left(ar{d}_3\gamma^\mu d_3 ight)$         | R               |
| eu_1111 | $(ar{e}_1\gamma_{\mu}e_1)(ar{u}_1\gamma^{\mu}u_1)$                           | R               |
| eu_1112 | $(ar{e}_1\gamma_\mu e_1)(ar{u}_1\gamma^\mu u_2)$                             | $^{\mathrm{C}}$ |
| eu_1113 | $(ar{e}_1\gamma_{\mu}e_1)(ar{u}_1\gamma^{\mu}u_3)$                           | $^{\mathrm{C}}$ |
| eu_1122 | $(ar{e}_1\gamma_{\mu}e_1)(ar{u}_2\gamma^{\mu}u_2)$                           | R               |
| eu_1123 | $(ar{e}_1\gamma_\mu e_1)(ar{u}_2\gamma^\mu u_3)$                             | $\mathbf{C}$    |
| eu_1133 | $(ar{e}_1\gamma_{\mu}e_1)(ar{u}_3\gamma^{\mu}u_3)$                           | R               |
| eu_1211 | $(ar{e}_1\gamma_{\mu}e_2)(ar{u}_1\gamma^{\mu}u_1)$                           | $^{\mathrm{C}}$ |
| eu_1212 | $(ar{e}_1\gamma_{\mu}e_2)(ar{u}_1\gamma^{\mu}u_2)$                           | $^{\mathrm{C}}$ |
| eu_1213 | $(ar{e}_1\gamma_\mu e_2)(ar{u}_1\gamma^\mu u_3)$                             | C               |
| eu_1221 | $(ar{e}_1\gamma_\mu e_2)(ar{u}_2\gamma^\mu u_1)$                             | $\mathbf{C}$    |
| eu_1222 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$       | $\mathbf{C}$    |
| eu_1223 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$       | $\mathbf{C}$    |
| eu_1231 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{u}_3\gamma^{\mu}u_1 ight)$       | $\mathbf{C}$    |
| eu_1232 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{u}_3\gamma^{\mu}u_2 ight)$       | $\mathbf{C}$    |
| eu_1233 | $\left(\bar{e}_1\gamma_{\mu}e_2\right)\left(\bar{u}_3\gamma^{\mu}u_3\right)$ | $\mathbf{C}$    |
| eu_1311 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_1\gamma^{\mu}u_1 ight)$       | $\mathbf{C}$    |
| eu_1312 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_1\gamma^{\mu}u_2 ight)$       | $\mathbf{C}$    |
| eu_1313 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_1\gamma^{\mu}u_3 ight)$       | $\mathbf{C}$    |
| eu_1321 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_2\gamma^{\mu}u_1 ight)$       | $\mathbf{C}$    |
| eu_1322 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$       | $\mathbf{C}$    |
| eu_1323 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$       | $\mathbf{C}$    |
| eu_1331 | $\left(\bar{e}_1\gamma_{\mu}e_3\right)\left(\bar{u}_3\gamma^{\mu}u_1\right)$ | $^{\mathrm{C}}$ |
| eu_1332 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_3\gamma^{\mu}u_2 ight)$       | $^{\mathrm{C}}$ |
| eu_1333 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$       | $^{\mathrm{C}}$ |
| eu_2211 | $\left(\bar{e}_2\gamma_{\mu}e_2\right)\left(\bar{u}_1\gamma^{\mu}u_1\right)$ | R               |
| eu_2212 | $\left(\bar{e}_2\gamma_{\mu}e_2\right)\left(\bar{u}_1\gamma^{\mu}u_2\right)$ | $^{\mathrm{C}}$ |
| eu_2213 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{u}_1\gamma^{\mu}u_3 ight)$       | $^{\mathrm{C}}$ |
| eu_2222 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$       | R               |
| eu_2223 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$       | $^{\mathrm{C}}$ |
| eu_2233 | $\left(\bar{e}_2\gamma_{\mu}e_2\right)\left(\bar{u}_3\gamma^{\mu}u_3\right)$ | ${ m R}$        |
| eu_2311 | $\left(\bar{e}_2\gamma_{\mu}e_3\right)\left(\bar{u}_1\gamma^{\mu}u_1\right)$ | $^{\mathrm{C}}$ |
| eu_2312 | $\left(ar{e}_2\gamma_{\mu}e_3 ight)\left(ar{u}_1\gamma^{\mu}u_2 ight)$       | $^{\mathrm{C}}$ |
| eu_2313 | $(\bar{e}_2\gamma_\mu e_3)(\bar{u}_1\gamma^\mu u_3)$                         | $^{\mathrm{C}}$ |
| eu_2321 | $\left(ar{e}_2\gamma_{\mu}e_3 ight)\left(ar{u}_2\gamma^{\mu}u_1 ight)$       | $^{\mathrm{C}}$ |
| eu_2322 | $\left(ar{e}_2\gamma_{\mu}e_3 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$       | С               |
| eu_2323 | $(ar{e}_2\gamma_\mu e_3)(ar{u}_2\gamma^\mu u_3)$                             | C               |
| eu_2331 | $(ar{e}_2\gamma_\mu e_3)(ar{u}_3\gamma^\mu u_1)$                             | C               |
| eu_2332 | $(ar{e}_2\gamma_\mu e_3)(ar{u}_3\gamma^\mu u_2)$                             | C               |
| eu_2333 | $\left(ar{e}_2\gamma_{\mu}e_3 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$       | $\mathbf{C}$    |
| eu_3311 | $\left(ar{e}_3\gamma_{\mu}e_3 ight)\left(ar{u}_1\gamma^{\mu}u_1 ight)$       | R               |
| eu_3312 | $(ar{e}_3\gamma_\mu e_3)(ar{u}_1\gamma^\mu u_2)$                             | C               |
| eu_3313 | $(\bar{e}_3\gamma_\mu e_3)(\bar{u}_1\gamma^\mu u_3)$                         | С               |
|         |  |                 |

| WC name | Operator   | Type            |
|---------|--|-----------------|
| eu_3322 | $(\bar{e}_3\gamma_\mu e_3)(\bar{u}_2\gamma^\mu u_2)$                   | R               |
| eu_3323 | $(ar{e}_3\gamma_\mu e_3)(ar{u}_2\gamma^\mu u_3)$                       | $\mathbf{C}$    |
| eu_3333 | $\left(ar{e}_3\gamma_{\mu}e_3 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$ | $\mathbf{R}$    |
| ed_1111 | $(ar{e}_1\gamma_{\mu}e_1)\left(ar{d}_1\gamma^{\mu}d_1 ight)$           | $\mathbf{R}$    |
| ed_1112 | $\left(ar{e}_1\gamma_{\mu}e_1 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$ | С               |
| ed_1113 | $\left(ar{e}_1\gamma_{\mu}e_1 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$ | С               |
| ed_1122 | $\left(ar{e}_1\gamma_{\mu}e_1 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | $\mathbf{R}$    |
| ed_1123 | $(ar{e}_1\gamma_{\mu}e_1)\left(ar{d}_2\gamma^{\mu}d_3 ight)$           | С               |
| ed_1133 | $\left(ar{e}_1\gamma_{\mu}e_1 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$ | $\mathbf{R}$    |
| ed_1211 | $(ar{e}_1\gamma_{\mu}e_2)\left(ar{d}_1\gamma^{\mu}d_1 ight)$           | С               |
| ed_1212 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$ | С               |
| ed_1213 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$ | С               |
| ed_1221 | $(ar{e}_1\gamma_{\mu}e_2)\left(ar{d}_2\gamma^{\mu}d_1 ight)$           | $\mathbf{C}$    |
| ed_1222 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | $\mathbf{C}$    |
| ed_1223 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$ | $^{\mathrm{C}}$ |
| ed_1231 | $(ar{e}_1\gamma_{\mu}e_2)\left(ar{d}_3\gamma^{\mu}d_1 ight)$           | $\mathbf{C}$    |
| ed_1232 | $(ar{e}_1\gamma_{\mu}e_2)\left(ar{d}_3\gamma^{\mu}d_2 ight)$           | С               |
| ed_1233 | $\left(ar{e}_1\gamma_{\mu}e_2 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$ | С               |
| ed_1311 | $(ar{e}_1\gamma_{\mu}e_3)\left(ar{d}_1\gamma^{\mu}d_1 ight)$           | $\mathbf{C}$    |
| ed_1312 | $(ar{e}_1\gamma_{\mu}e_3)\left(ar{d}_1\gamma^{\mu}d_2 ight)$           | $\mathbf{C}$    |
| ed_1313 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$ | С               |
| ed_1321 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{d}_2\gamma^{\mu}d_1 ight)$ | С               |
| ed_1322 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | С               |
| ed_1323 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$ | С               |
| ed_1331 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{d}_3\gamma^{\mu}d_1 ight)$ | $\mathbf{C}$    |
| ed_1332 | $\left(ar{e}_1\gamma_{\mu}e_3 ight)\left(ar{d}_3\gamma^{\mu}d_2 ight)$ | С               |
| ed_1333 | $(ar{e}_1\gamma_{\mu}e_3)\left(ar{d}_3\gamma^{\mu}d_3 ight)$           | С               |
| ed_2211 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{d}_1\gamma^{\mu}d_1 ight)$ | $\mathbf{R}$    |
| ed_2212 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$ | С               |
| ed_2213 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$ | С               |
| ed_2222 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | $\mathbf{R}$    |
| ed_2223 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$ | $\mathbf{C}$    |
| ed_2233 | $\left(ar{e}_2\gamma_{\mu}e_2 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$ | R               |
| ed_2311 | $(ar{e}_2\gamma_{\mu}e_3)\left(ar{d}_1\gamma^{\mu}d_1 ight)$           | $\mathbf{C}$    |
| ed_2312 | $(ar{e}_2\gamma_{\mu}e_3)\left(ar{d}_1\gamma^{\mu}d_2 ight)$           | $\mathbf{C}$    |
| ed_2313 | $(ar{e}_2\gamma_{\mu}e_3)\left(ar{d}_1\gamma^{\mu}d_3 ight)$           | $\mathbf{C}$    |
| ed_2321 | $(ar{e}_2\gamma_\mu e_3)\left(ar{d}_2\gamma^\mu d_1 ight)$             | $\mathbf{C}$    |
| ed_2322 | $\left(ar{e}_2\gamma_{\mu}e_3 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | $\mathbf{C}$    |
| ed_2323 | $(ar{e}_2\gamma_{\mu}e_3)\left(ar{d}_2\gamma^{\mu}d_3 ight)$           | $\mathbf{C}$    |
| ed_2331 | $(ar{e}_2\gamma_\mu e_3)ig(ar{d}_3\gamma^\mu d_1ig)$                   | $\mathbf{C}$    |
| ed_2332 | $(ar{e}_2\gamma_{\mu}e_3)ig(ar{d}_3\gamma^{\mu}d_2ig)$                 | $\mathbf{C}$    |
| ed_2333 | $(ar{e}_2\gamma_{\mu}e_3)\left(ar{d}_3\gamma^{\mu}d_3 ight)$           | $\mathbf{C}$    |
|         |  |                 |

| WC name  | Operator   | Type         |
|----------|--|--------------|
| ed_3311  | $(\bar{e}_3\gamma_\mu e_3)(\bar{d}_1\gamma^\mu d_1)$                   | R            |
| ed_3312  | $(ar{e}_3\gamma_\mu e_3) \left(ar{d}_1\gamma^\mu d_2 ight)$            | $\mathbf{C}$ |
| ed_3313  | $(ar{e}_3\gamma_\mu e_3)ig(ar{d}_1\gamma^\mu d_3ig)$                   | $\mathbf{C}$ |
| ed_3322  | $(ar{e}_3\gamma_{\mu}e_3)ig(ar{d}_2\gamma^{\mu}d_2ig)$                 | $\mathbf{R}$ |
| ed_3323  | $(ar{e}_3\gamma_{\mu}e_3)ig(ar{d}_2\gamma^{\mu}d_3ig)$                 | $\mathbf{C}$ |
| ed_3333  | $\left(ar{e}_3\gamma_{\mu}e_3 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$ | $\mathbf{R}$ |
| ud1_1111 | $(ar{u}_1\gamma_\mu u_1) \left(ar{d}_1\gamma^\mu d_1 ight)$            | $\mathbf{R}$ |
| ud1_1112 | $\left(ar{u}_1\gamma_{\mu}u_1 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$ | $\mathbf{C}$ |
| ud1_1113 | $\left(ar{u}_1\gamma_{\mu}u_1 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$ | $\mathbf{C}$ |
| ud1_1122 | $\left(ar{u}_1\gamma_{\mu}u_1 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | $\mathbf{R}$ |
| ud1_1123 | $\left(ar{u}_1\gamma_{\mu}u_1 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$ | $\mathbf{C}$ |
| ud1_1133 | $\left(ar{u}_1\gamma_{\mu}u_1 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$ | $\mathbf{R}$ |
| ud1_1211 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_1\gamma^{\mu}d_1 ight)$ | $\mathbf{C}$ |
| ud1_1212 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$ | $\mathbf{C}$ |
| ud1_1213 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$ | $\mathbf{C}$ |
| ud1_1221 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_2\gamma^{\mu}d_1 ight)$ | $\mathbf{C}$ |
| ud1_1222 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | $\mathbf{C}$ |
| ud1_1223 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$ | $\mathbf{C}$ |
| ud1_1231 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_3\gamma^{\mu}d_1 ight)$ | $\mathbf{C}$ |
| ud1_1232 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_3\gamma^{\mu}d_2 ight)$ | $\mathbf{C}$ |
| ud1_1233 | $\left(ar{u}_1\gamma_{\mu}u_2 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$ | С            |
| ud1_1311 | $(ar{u}_1\gamma_\mu u_3) \left(ar{d}_1\gamma^\mu d_1 ight)$            | $\mathbf{C}$ |
| ud1_1312 | $\left(ar{u}_1\gamma_{\mu}u_3 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$ | С            |
| ud1_1313 | $(ar{u}_1\gamma_\mu u_3) \left(ar{d}_1\gamma^\mu d_3 ight)$            | С            |
| ud1_1321 | $\left(ar{u}_1\gamma_{\mu}u_3 ight)\left(ar{d}_2\gamma^{\mu}d_1 ight)$ | $\mathbf{C}$ |
| ud1_1322 | $(ar{u}_1\gamma_{\mu}u_3)\left(ar{d}_2\gamma^{\mu}d_2 ight)$           | $\mathbf{C}$ |
| ud1_1323 | $\left(ar{u}_1\gamma_{\mu}u_3 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$ | $\mathbf{C}$ |
| ud1_1331 | $\left(ar{u}_1\gamma_{\mu}u_3 ight)\left(ar{d}_3\gamma^{\mu}d_1 ight)$ | $\mathbf{C}$ |
| ud1_1332 | $(ar{u}_1\gamma_{\mu}u_3)\left(ar{d}_3\gamma^{\mu}d_2 ight)$           | С            |
| ud1_1333 | $(ar{u}_1\gamma_\mu u_3)ig(ar{d}_3\gamma^\mu d_3ig)$                   | С            |
| ud1_2211 | $(ar{u}_2\gamma_\mu u_2) \left(ar{d}_1\gamma^\mu d_1 ight)$            | $\mathbf{R}$ |
| ud1_2212 | $(ar{u}_2\gamma_\mu u_2)\left(ar{d}_1\gamma^\mu d_2 ight)$             | $\mathbf{C}$ |
| ud1_2213 | $\left(ar{u}_2\gamma_{\mu}u_2 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$ | $\mathbf{C}$ |
| ud1_2222 | $\left(ar{u}_2\gamma_{\mu}u_2 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$ | $\mathbf{R}$ |
| ud1_2223 | $(ar{u}_2\gamma_\mu u_2)\left(ar{d}_2\gamma^\mu d_3 ight)$             | $\mathbf{C}$ |
| ud1_2233 | $(ar{u}_2\gamma_\mu u_2)\left(ar{d}_3\gamma^\mu d_3 ight)$             | R            |
| ud1_2311 | $(ar{u}_2\gamma_\mu u_3)\left(ar{d}_1\gamma^\mu d_1 ight)$             | С            |
| ud1_2312 | $(ar{u}_2\gamma_\mu u_3)\left(ar{d}_1\gamma^\mu d_2 ight)$             | С            |
| ud1_2313 | $(ar{u}_2\gamma_\mu u_3) \left(ar{d}_1\gamma^\mu d_3 ight)$            | С            |
| ud1_2321 | $(ar{u}_2\gamma_\mu u_3)\left(ar{d}_2\gamma^\mu d_1 ight)$             | С            |
| ud1_2322 | $(ar{u}_2\gamma_\mu u_3) \left(ar{d}_2\gamma^\mu d_2 ight)$            | С            |
| ud1_2323 | $\left(ar{u}_2\gamma_{\mu}u_3 ight)\left(d_2\gamma^{\mu}d_3 ight)$     | С            |
|          |  |              |

| $\begin{array}{c} {\rm ud1}\_2331 & (\bar{u}_2\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_1) & C \\ {\rm ud1}\_2332 & (\bar{u}_2\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_2) & C \\ {\rm ud1}\_2333 & (\bar{u}_2\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) & C \\ {\rm ud1}\_2331 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_1) & R \\ {\rm ud1}\_3312 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_2) & C \\ {\rm ud1}\_3313 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_2) & C \\ {\rm ud1}\_3313 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_2) & C \\ {\rm ud1}\_3323 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_2\gamma^\mu d_2) & R \\ {\rm ud1}\_3323 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_2\gamma^\mu d_2) & R \\ {\rm ud1}\_3333 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_2\gamma^\mu d_3) & C \\ {\rm ud1}\_3333 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) & R \\ {\rm ud8}\_1111 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_1) & R \\ {\rm ud8}\_1112 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_2) & C \\ {\rm ud8}\_1113 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_2) & C \\ {\rm ud8}\_1113 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1123 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1123 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1123 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_3\gamma^\mu T^A d_3) & R \\ {\rm ud8}\_1211 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) & C \\ {\rm ud8}\_1213 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) & C \\ {\rm ud8}\_1213 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) & C \\ {\rm ud8}\_1222 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_2) & C \\ {\rm ud8}\_1223 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1221 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1221 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1221 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1231 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1231 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1231 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1323 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_3\gamma^\mu T^A d_3) & C \\ {\rm ud8}\_1323 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_3\gamma^\mu T^A d_3$  | WC name  | Operator  | Type            |
|--|----------|---|-----------------|
| $\begin{array}{c} \mathrm{ud1}\_2332 & (\bar{u}_2\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_2) \\ \mathrm{ud1}\_2333 & (\bar{u}_2\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) \\ \mathrm{ud1}\_3311 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_1) \\ \mathrm{ud1}\_3312 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_2) \\ \mathrm{ud1}\_3313 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_3) \\ \mathrm{ud1}\_3313 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_3) \\ \mathrm{ud1}\_3323 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_2\gamma^\mu d_3) \\ \mathrm{ud1}\_3323 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) \\ \mathrm{ud1}\_3333 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) \\ \mathrm{ud1}\_3333 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) \\ \mathrm{ud1}\_3333 & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) \\ \mathrm{ud1}\_111 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_1) \\ \mathrm{ud8}\_1112 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_1113 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_1122 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1123 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1123 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1213 & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1211 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_1212 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_1213 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_1222 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1223 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1223 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1223 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1223 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1231 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1313 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1313 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1313 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_1312 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_2211 & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_2211 & (\bar{u}_2\gamma_\mu T^A u_3) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_2212 & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ $   | ud1_2331 | $(ar{u}_2\gamma_\mu u_3)(ar{d}_3\gamma^\mu d_1)$                                  | C               |
| $\begin{array}{c} \mathrm{ud1}\_{2333} & (\bar{u}_2\gamma_\mu u_3) (\bar{d}_3\gamma^\mu d_3) \\ \mathrm{ud1}\_{3311} & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_1) \\ \mathrm{ud1}\_{3312} & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_2) \\ \mathrm{ud1}\_{3313} & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_2) \\ \mathrm{ud1}\_{3313} & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_1\gamma^\mu d_2) \\ \mathrm{ud1}\_{3322} & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_2\gamma^\mu d_2) \\ \mathrm{ud1}\_{3323} & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_2\gamma^\mu d_3) \\ \mathrm{ud1}\_{3323} & (\bar{u}_3\gamma_\mu u_3) (\bar{d}_2\gamma^\mu d_3) \\ \mathrm{ud8}\_{1111} & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_1) \\ \mathrm{ud8}\_{1112} & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1113} & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1122} & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1123} & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1123} & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1123} & (\bar{u}_1\gamma_\mu T^A u_1) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1211} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1212} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1212} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1221} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1222} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1221} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1222} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1223} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1223} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1231} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1232} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1331} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1332} & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1332} & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1332} & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1333} & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{2331} & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{2332} & (\bar{u}_1\gamma_\mu T^A u_3) (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{2331} & (\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{2331} & (\bar{u}_2\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{2331} & (\bar{u}_2\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{2331} &$  |          |   | $\mathbf{C}$    |
| $\begin{array}{c} {\rm ud1\_3311} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_1\gamma^\mu d_1\right) & {\rm R} \\ {\rm ud1\_3312} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_1\gamma^\mu d_2\right) & {\rm C} \\ {\rm ud1\_3313} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_1\gamma^\mu d_2\right) & {\rm C} \\ {\rm ud1\_3322} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_2\right) & {\rm R} \\ {\rm ud1\_3323} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_3\right) & {\rm C} \\ {\rm ud1\_3333} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_3\right) & {\rm R} \\ {\rm ud8\_1111} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & {\rm R} \\ {\rm ud8\_1112} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1113} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1113} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & {\rm R} \\ {\rm ud8\_1122} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1123} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1133} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & {\rm R} \\ {\rm ud8\_1211} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1212} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1213} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1221} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1222} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1223} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1233} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1233} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1233} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1331} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1331} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1331} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1332} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & {\rm C} \\ {\rm ud8\_1331} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & {\rm C} \\ {\rm ud8\_1332} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_2211} & (\bar{u}_2\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_221$   | ud1_2333 |   | $\mathbf{C}$    |
| $\begin{array}{c} {\rm ud1\_3312} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_1\gamma^\mu d_2\right) & {\rm C} \\ {\rm ud1\_3313} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_1\gamma^\mu d_3\right) & {\rm C} \\ {\rm ud1\_3322} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_2\right) & {\rm R} \\ {\rm ud1\_3323} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_3\right) & {\rm C} \\ {\rm ud1\_3323} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_3\right) & {\rm R} \\ {\rm ud1\_3323} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_3\right) & {\rm R} \\ {\rm ud1\_3333} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_3\gamma^\mu d_3\right) & {\rm R} \\ {\rm ud8\_1111} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & {\rm R} \\ {\rm ud8\_1112} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1113} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1122} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1123} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm R} \\ {\rm ud8\_1212} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & {\rm R} \\ {\rm ud8\_1211} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & {\rm C} \\ {\rm ud8\_1213} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1213} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1221} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1222} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1223} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1223} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1233} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1232} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1311} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & {\rm C} \\ {\rm ud8\_1312} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1312} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1312} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1322} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1331} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_1331} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & {\rm C} \\ {\rm ud8\_2211} & ($   | ud1_3311 |   | R               |
| $\begin{array}{c} \mathrm{ud1\_3313} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_1\gamma^\mu d_3\right) & C \\ \mathrm{ud1\_3322} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_2\right) & R \\ \mathrm{ud1\_3333} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_2\gamma^\mu d_3\right) & C \\ \mathrm{ud1\_3333} & (\bar{u}_3\gamma_\mu u_3) \left(\bar{d}_3\gamma^\mu d_3\right) & R \\ \mathrm{ud8\_1111} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & R \\ \mathrm{ud8\_1112} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1113} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1122} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1123} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1133} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1133} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & R \\ \mathrm{ud8\_1211} & (\bar{u}_1\gamma_\mu T^A u_1) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1212} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1213} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1213} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1223} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1223} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1223} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1233} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1233} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1233} & (\bar{u}_1\gamma_\mu T^A u_2) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1311} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1312} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1313} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1323} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & C \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_\mu T^A u_3) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_2213} & (\bar{u}_2\gamma_\mu T^A u_2) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & C \\ \mathrm{ud8\_2213} & (\bar{u}_2\gamma_\mu $   | ud1_3312 |   | $\mathbf{C}$    |
| $\begin{array}{c} \mathrm{ud1}\_{3322} & (\bar{u}_3\gamma_\mu u_3)  (\bar{d}_2\gamma^\mu d_2) \\ \mathrm{ud1}\_{3323} & (\bar{u}_3\gamma_\mu u_3)  (\bar{d}_2\gamma^\mu d_3) \\ \mathrm{ud1}\_{3333} & (\bar{u}_3\gamma_\mu u_3)  (\bar{d}_3\gamma^\mu d_3) \\ \mathrm{ud8}\_{1111} & (\bar{u}_1\gamma_\mu T^A u_1)  (\bar{d}_1\gamma^\mu T^A d_1) \\ \mathrm{ud8}\_{1111} & (\bar{u}_1\gamma_\mu T^A u_1)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1112} & (\bar{u}_1\gamma_\mu T^A u_1)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1113} & (\bar{u}_1\gamma_\mu T^A u_1)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1122} & (\bar{u}_1\gamma_\mu T^A u_1)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1122} & (\bar{u}_1\gamma_\mu T^A u_1)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1123} & (\bar{u}_1\gamma_\mu T^A u_1)  (\bar{d}_3\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1211} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1212} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1213} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1221} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1222} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1223} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1223} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1233} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_3\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1233} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_3\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1331} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_3\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1311} & (\bar{u}_1\gamma_\mu T^A u_2)  (\bar{d}_3\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1312} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1313} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1323} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1321} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_3) \\ \mathrm{ud8}\_{1322} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1323} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1323} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1323} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1323} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1323} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{1323} & (\bar{u}_1\gamma_\mu T^A u_3)  (\bar{d}_2\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{2313} & (\bar{u}_2\gamma_\mu T^A u_2)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{2223} & (\bar{u}_2\gamma_\mu T^A u_2)  (\bar{d}_1\gamma^\mu T^A d_2) \\ \mathrm{ud8}\_{2223} & (\bar{u}_2$   | ud1_3313 |   | $\mathbf{C}$    |
| $\begin{array}{c} \mathrm{ud1\_3323} & (\bar{u}_3\gamma_{\mu}u_3) \left(\bar{d}_2\gamma^{\mu}d_3\right) \\ \mathrm{ud1\_3333} & (\bar{u}_3\gamma_{\mu}u_3) \left(\bar{d}_3\gamma^{\mu}d_3\right) \\ \mathrm{ud8\_1111} & (\bar{u}_1\gamma_{\mu}T^Au_1) \left(\bar{d}_1\gamma^{\mu}T^Ad_1\right) \\ \mathrm{ud8\_1112} & (\bar{u}_1\gamma_{\mu}T^Au_1) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1113} & (\bar{u}_1\gamma_{\mu}T^Au_1) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1113} & (\bar{u}_1\gamma_{\mu}T^Au_1) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1122} & (\bar{u}_1\gamma_{\mu}T^Au_1) \left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1123} & (\bar{u}_1\gamma_{\mu}T^Au_1) \left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_1123} & (\bar{u}_1\gamma_{\mu}T^Au_1) \left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_1213} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_1\gamma^{\mu}T^Ad_1\right) \\ \mathrm{ud8\_1212} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1213} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1213} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1221} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1223} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) \\ \mathrm{ud8\_1223} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1233} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) \\ \mathrm{ud8\_1232} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_3\gamma^{\mu}T^Ad_1\right) \\ \mathrm{ud8\_1233} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1233} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1311} & (\bar{u}_1\gamma_{\mu}T^Au_2) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1311} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1321} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1322} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1323} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1331} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1332} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_1333} & (\bar{u}_1\gamma_{\mu}T^Au_3) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \mathrm{ud8\_2212} & (\bar{u}_2\gamma_{\mu}T^Au_3) \left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_2211} & (\bar{u}_2\gamma_{\mu}T^Au_3) \left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_2212} & (\bar{u}_2\gamma_{\mu}T^Au_3) \left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_2213} & (\bar{u}_2\gamma_{\mu}T^Au_2) \left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_2233} & (\bar{u}_2\gamma_{\mu}T^Au_2) \left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_2233} & (\bar{u}_2\gamma_{\mu}T^Au_2) \left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) \\ \mathrm{ud8\_2312} & (\bar{u}_2$  | ud1_3322 |   | R               |
| $\begin{array}{c} \text{ud8\_1111} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & \text{R} \\ \text{ud8\_1112} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1113} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1122} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & \text{R} \\ \text{ud8\_1123} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1133} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{R} \\ \text{ud8\_1211} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{R} \\ \text{ud8\_1212} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1231} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_2212} & \left(\bar{u}_2\gamma_\mu T^A$                                      | ud1_3323 |   | C               |
| $\begin{array}{c} \text{ud8\_1111} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & \text{R} \\ \text{ud8\_1112} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1113} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1122} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & \text{R} \\ \text{ud8\_1123} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1133} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{R} \\ \text{ud8\_1211} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{R} \\ \text{ud8\_1212} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1231} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_2212} & \left(\bar{u}_2\gamma_\mu T^A$                                      | ud1_3333 | $(ar{u}_3\gamma_\mu u_3)ig(ar{d}_3\gamma^\mu d_3ig)$                              | R               |
| $\begin{array}{c} \text{ud8\_1113} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1122} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & \text{R} \\ \text{ud8\_1123} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1133} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{R} \\ \text{ud8\_1211} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1212} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1231} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1321} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2213} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2223} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_\mu T^A$                                      | ud8_1111 | $\left(ar{u}_1\gamma_\mu T^A u_1 ight)\left(ar{d}_1\gamma^\mu T^A d_1 ight)$      | R               |
| $\begin{array}{c} \text{ud8\_1122} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) \\ \text{ud8\_1123} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) \\ \text{ud8\_1133} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_1211} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_1\right) \\ \text{ud8\_1212} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_1\right) \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) \\ \text{ud8\_1231} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_1\right) \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_2\right) \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_1\right) \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_1332} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) \\ \text{ud8\_2212} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_2222} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) \\ \text{ud8\_2311} & \left(\bar{u}_2\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) \\$ | ud8_1112 |   | C               |
| $\begin{array}{c} \text{ud8\_1123} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1133} & \left(\bar{u}_1\gamma_\mu T^A u_1\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{R} \\ \text{ud8\_1211} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1212} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1231} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_\mu T^A u_2\right) \left(\bar{d}_3\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_1\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_1\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_2\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_1332} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_\mu T^A u_3\right) \left(\bar{d}_3\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_2213} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_2213} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_1\gamma^\mu T^A d_2\right) & \text{C} \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2231} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2232} & \left(\bar{u}_2\gamma_\mu T^A u_2\right) \left(\bar{d}_2\gamma^\mu T^A d_3\right) & \text{C} \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_\mu T^A$                                      | ud8_1113 | $(\bar{u}_1\gamma_\mu T^A u_1)(\bar{d}_1\gamma^\mu T^A d_3)$                      | $^{\mathrm{C}}$ |
| $\begin{array}{c} \text{ud8\_1133} & \left( \bar{u}_1 \gamma_\mu T^A u_1 \right) \left( \bar{d}_3 \gamma^\mu T^A d_3 \right) & \text{R} \\ \text{ud8\_1211} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_1 \gamma^\mu T^A d_1 \right) & \text{C} \\ \text{ud8\_1212} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_1 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1213} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1221} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_2 \gamma^\mu T^A d_1 \right) & \text{C} \\ \text{ud8\_1222} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_2 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1223} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_2 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1223} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_2 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1231} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_3 \gamma^\mu T^A d_1 \right) & \text{C} \\ \text{ud8\_1232} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_3 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1233} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_3 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1311} & \left( \bar{u}_1 \gamma_\mu T^A u_2 \right) \left( \bar{d}_3 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1312} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1313} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1313} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1322} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_2 \gamma^\mu T^A d_1 \right) & \text{C} \\ \text{ud8\_1322} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_2 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1333} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_2 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1332} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_3 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_1332} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_3 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1333} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_3 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1333} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_3 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1333} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_3 \gamma^\mu T^A d_2 \right) & \text{C} \\ \text{ud8\_1333} & \left( \bar{u}_1 \gamma_\mu T^A u_3 \right) \left( \bar{d}_3 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_2211} & \left( \bar{u}_2 \gamma_\mu T^A u_2 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_2222} & \left( \bar{u}_2 \gamma_\mu T^A u_2 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_2223} & \left( \bar{u}_2 \gamma_\mu T^A u_2 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & \text{C} \\ \text{ud8\_2233} & \left( \bar{u}_2 \gamma_\mu T^A u_3 \right) \left( \bar{d}_1 \gamma^\mu T^A d_3 \right) & $  | ud8_1122 |   | R               |
| $\begin{array}{c} \text{ud8\_1211} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1212} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1321} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1332} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_2213} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_2223} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_2311} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & $              | ud8_1123 |   | C               |
| $\begin{array}{c} \text{ud8\_1212} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1213} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1231} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_3\gamma^{\mu}T^Ad_1\right) \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_1321} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_1332} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_3\gamma^{\mu}T^Ad_1\right) \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right) \left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_2212} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_2213} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_2223} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_2231} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right) \left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) \\ \text{ud8\_2311} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_1\right) \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right) \left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) \\$ | ud8_1133 | $(\bar{u}_1\gamma_\mu T^A u_1)(\bar{d}_3\gamma^\mu T^A d_3)$                      | R               |
| $\begin{array}{c} \text{ud8\_1213} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1221} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1222} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1223} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1231} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1232} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1233} & \left(\bar{u}_1\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1311} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1312} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1313} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1321} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1322} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1323} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1331} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) & \text{C} \\ \text{ud8\_1332} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_1333} & \left(\bar{u}_1\gamma_{\mu}T^Au_3\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_2211} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_2213} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_2223} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{R} \\ \text{ud8\_2223} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_2\gamma^{\mu}T^Ad_3\right) & \text{R} \\ \text{ud8\_2233} & \left(\bar{u}_2\gamma_{\mu}T^Au_2\right)\left(\bar{d}_3\gamma^{\mu}T^Ad_3\right) & \text{R} \\ \text{ud8\_2311} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_1\right) & \text{C} \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \text{ud8\_2312} & \left(\bar{u}_2\gamma_{\mu}T^Au_3\right)\left(\bar{d}_1\gamma^{\mu}T^Ad_2\right) & \text{C} \\ \end{array}$   | ud8_1211 |   | C               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1212 | $(\bar{u}_1\gamma_\mu T^A u_2) (\bar{d}_1\gamma^\mu T^A d_2)$                     | C               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1213 | $(\bar{u}_1\gamma_\mu T^A u_2)(\bar{d}_1\gamma^\mu T^A d_3)$                      | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1221 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1222 | $(\bar{u}_1\gamma_\mu T^A u_2)(\bar{d}_2\gamma^\mu T^A d_2)$                      | C               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1223 |   | C               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1231 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1232 | $(\bar{u}_1\gamma_\mu T^A u_2)(\bar{d}_3\gamma^\mu T^A d_2)$                      | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1233 |   | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1311 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1312 | $(\bar{u}_1\gamma_{\mu}T^Au_3)(\bar{d}_1\gamma^{\mu}T^Ad_2)$                      | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1313 | $(\bar{u}_1\gamma_\mu T^A u_3)(\bar{d}_1\gamma^\mu T^A d_3)$                      | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1321 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1322 | $(\bar{u}_1\gamma_\mu T^A u_3)(\bar{d}_2\gamma^\mu T^A d_2)$                      | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1323 | $(\bar{u}_1\gamma_\mu T^A u_3)(\bar{d}_2\gamma^\mu T^A d_3)$                      | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1331 |   | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1332 | $(\bar{u}_1\gamma_\mu T^A u_3)(\bar{d}_3\gamma^\mu T^A d_2)$                      | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_1333 | $(\bar{u}_1\gamma_\mu T^A u_3)(\bar{d}_3\gamma^\mu T^A d_3)$                      | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_2211 | $(\bar{u}_2\gamma_\mu T^A u_2)(\bar{d}_1\gamma^\mu T^A d_1)$                      | R               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   |          |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   |          | $(\bar{\eta}_2 \gamma_{\cdot \cdot} T^A \eta_2) (\bar{d}_1 \gamma^{\mu} T^A d_2)$ | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_2222 | $(\bar{u}_2\gamma_\mu T^A u_2)(\bar{d}_2\gamma^\mu T^A d_2)$                      | R               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_2223 | $(\bar{u}_2\gamma_\mu T^A u_2)(\bar{d}_2\gamma^\mu T^A d_3)$                      | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | ud8_2233 | $\left(ar{u}_2\gamma_{\mu}T^Au_2 ight)\left(ar{d}_3\gamma^{\mu}T^Ad_3 ight)$      | R               |
| ud8_2312 $\left(\bar{u}_{2}\gamma_{\mu}T^{A}u_{3}\right)\left(\bar{d}_{1}\gamma^{\mu}T^{A}d_{2}\right)$ C Ud8_2313 $\left(\bar{u}_{2}\gamma_{\mu}T^{A}u_{3}\right)\left(\bar{d}_{1}\gamma^{\mu}T^{A}d_{3}\right)$ C  |          | $\left(ar{u}_2\gamma_{\mu}T^Au_3 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_1 ight)$      | $\mathbf{C}$    |
| ud8_2313 $\left(\bar{u}_2\gamma_\mu T^A u_3\right)\left(\bar{d}_1\gamma^\mu T^A d_3\right)$ C  | ud8_2312 | $\left(ar{u}_2\gamma_{\mu}T^Au_3 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_2 ight)$      | $\mathbf{C}$    |
|  | ud8_2313 | $\left(ar{u}_2\gamma_\mu T^A u_3 ight)\left(ar{d}_1\gamma^\mu T^A d_3 ight)$      | $^{\mathrm{C}}$ |

| WC name  | Operator   | Type            |
|----------|--|-----------------|
| ud8_2321 | $(\bar{u}_2\gamma_\mu T^A u_3) (\bar{d}_2\gamma^\mu T^A d_1)$                      | C               |
| ud8_2322 | $\left(\bar{u}_2\gamma_\mu T^A u_3\right)\left(\bar{d}_2\gamma^\mu T^A d_2\right)$ | $\mathbf{C}$    |
| ud8_2323 | $\left(ar{u}_2\gamma_\mu T^A u_3\right)\left(ar{d}_2\gamma^\mu T^A d_3\right)$     | $\mathbf{C}$    |
| ud8_2331 | $(\bar{u}_2\gamma_\mu T^A u_3)(\bar{d}_3\gamma^\mu T^A d_1)$                       | $\mathbf{C}$    |
| ud8_2332 | $(\bar{u}_2\gamma_\mu T^A u_3)(\bar{d}_3\gamma^\mu T^A d_2)$                       | $\mathbf{C}$    |
| ud8_2333 | $(\bar{u}_2\gamma_\mu T^A u_3)(\bar{d}_3\gamma^\mu T^A d_3)$                       | $\mathbf{C}$    |
| ud8_3311 | $(\bar{u}_3\gamma_\mu T^A u_3)(\bar{d}_1\gamma^\mu T^A d_1)$                       | R               |
| ud8_3312 | $(\bar{u}_3\gamma_\mu T^A u_3)(\bar{d}_1\gamma^\mu T^A d_2)$                       | $\mathbf{C}$    |
| ud8_3313 | $(\bar{u}_3\gamma_\mu T^A u_3)(\bar{d}_1\gamma^\mu T^A d_3)$                       | $\mathbf{C}$    |
| ud8_3322 | $(\bar{u}_3\gamma_\mu T^A u_3)(\bar{d}_2\gamma^\mu T^A d_2)$                       | R               |
| ud8_3323 | $(\bar{u}_3\gamma_\mu T^Au_3)(\bar{d}_2\gamma^\mu T^Ad_3)$                         | C               |
| ud8_3333 | $(\bar{u}_3\gamma_\mu T^A u_3)(\bar{d}_3\gamma^\mu T^A d_3)$                       | R               |
| le_1111  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{e}_1\gamma^\mu e_1 ight)$          | R               |
| le_1112  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{e}_1\gamma^\mu e_2 ight)$          | C               |
| le_1113  | $(ar{\ell}_1\gamma_\mu\ell_1)(ar{e}_1\gamma^\mu e_3)$                              | $^{\mathrm{C}}$ |
| le_1122  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{e}_2\gamma^\mu e_2 ight)$          | R               |
| le_1123  | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{e}_2\gamma^\mu e_3 ight)$          | C               |
| le_1133  | $(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{e}_3\gamma^\mu e_3)$                          | R               |
| le_1211  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_1\gamma^\mu e_1 ight)$          | $^{\mathrm{C}}$ |
| le_1212  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_1\gamma^\mu e_2 ight)$          | C               |
| le_1213  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_1\gamma^\mu e_3 ight)$          | $^{\mathrm{C}}$ |
| le_1221  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_2\gamma^\mu e_1 ight)$          | C               |
| le_1222  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_2\gamma^\mu e_2 ight)$          | $^{\mathrm{C}}$ |
| le_1223  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_2\gamma^\mu e_3 ight)$          | $^{\mathrm{C}}$ |
| le_1231  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_3\gamma^\mu e_1 ight)$          | $^{\mathrm{C}}$ |
| le_1232  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_3\gamma^\mu e_2 ight)$          | $^{\mathrm{C}}$ |
| le_1233  | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{e}_3\gamma^\mu e_3 ight)$          | $\mathbf{C}$    |
| le_1311  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_1\gamma^\mu e_1 ight)$          | $^{\mathrm{C}}$ |
| le_1312  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_1\gamma^\mu e_2 ight)$          | $\mathbf{C}$    |
| le_1313  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_1\gamma^\mu e_3 ight)$          | $\mathbf{C}$    |
| le_1321  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_2\gamma^\mu e_1 ight)$          | $\mathbf{C}$    |
| le_1322  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_2\gamma^\mu e_2 ight)$          | $^{\mathrm{C}}$ |
| le_1323  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_2\gamma^\mu e_3 ight)$          | $\mathbf{C}$    |
| le_1331  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_3\gamma^\mu e_1 ight)$          | $\mathbf{C}$    |
| le_1332  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_3\gamma^\mu e_2 ight)$          | $\mathbf{C}$    |
| le_1333  | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{e}_3\gamma^\mu e_3 ight)$          | $\mathbf{C}$    |
| le_2211  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{e}_1\gamma^\mu e_1 ight)$          | R               |
| le_2212  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{e}_1\gamma^\mu e_2 ight)$          | $^{\mathrm{C}}$ |
| le_2213  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{e}_1\gamma^\mu e_3 ight)$          | $\mathbf{C}$    |
| le_2222  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{e}_2\gamma^\mu e_2 ight)$          | R               |
| le_2223  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{e}_2\gamma^\mu e_3 ight)$          | $^{\mathrm{C}}$ |
| le_2233  | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{e}_3\gamma^\mu e_3 ight)$          | R               |

| WC name | Operator  | Type         |
|---------|---|--------------|
| le_2311 | $(\bar{\ell}_2\gamma_\mu\ell_3)(\bar{e}_1\gamma^\mu e_1)$                       | С            |
| le_2312 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{e}_1\gamma^\mu e_2)$                           | $\mathbf{C}$ |
| le_2313 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{e}_1\gamma^\mu e_3)$                           | $\mathbf{C}$ |
| le_2321 | $(\bar{\ell}_2\gamma_\mu\ell_3)(\bar{e}_2\gamma^\mu e_1)$                       | $\mathbf{C}$ |
| le_2322 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{e}_2\gamma^\mu e_2)$                           | $\mathbf{C}$ |
| le_2323 | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{e}_2\gamma^\mu e_3)$                           | $\mathbf{C}$ |
| le_2331 | $(\bar{\ell}_2\gamma_\mu\ell_3)(\bar{e}_3\gamma^\mu e_1)$                       | $\mathbf{C}$ |
| le_2332 | $(\bar{\ell}_2\gamma_\mu\ell_3)(\bar{e}_3\gamma^\mu e_2)$                       | $\mathbf{C}$ |
| le_2333 | $(\bar{\ell}_2\gamma_\mu\ell_3)(\bar{e}_3\gamma^\mu e_3)$                       | $\mathbf{C}$ |
| le_3311 | $(\bar{\ell}_3\gamma_\mu\ell_3)(\bar{e}_1\gamma^\mu e_1)$                       | $\mathbf{R}$ |
| le_3312 | $(\bar{\ell}_3\gamma_\mu\ell_3)(\bar{e}_1\gamma^\mu e_2)$                       | $\mathbf{C}$ |
| le_3313 | $\left(\bar{\ell}_3\gamma_\mu\ell_3\right)\left(\bar{e}_1\gamma^\mu e_3\right)$ | $\mathbf{C}$ |
| le_3322 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{e}_2\gamma^\mu e_2 ight)$       | $\mathbf{R}$ |
| le_3323 | $\left(ar{\ell}_3\gamma_\mu\ell_3\right)\left(ar{e}_2\gamma^\mu e_3 ight)$      | $\mathbf{C}$ |
| le_3333 | $(\bar{\ell}_3\gamma_\mu\ell_3)(\bar{e}_3\gamma^\mu e_3)$                       | $\mathbf{R}$ |
| lu_1111 | $(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{u}_1\gamma^\mu u_1)$                       | $\mathbf{R}$ |
| lu_1112 | $(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{u}_1\gamma^\mu u_2)$                       | $\mathbf{C}$ |
| lu_1113 | $(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{u}_1\gamma^\mu u_3)$                       | $\mathbf{C}$ |
| lu_1122 | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{u}_2\gamma^\mu u_2 ight)$       | $\mathbf{R}$ |
| lu_1123 | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{u}_2\gamma^\mu u_3 ight)$       | $\mathbf{C}$ |
| lu_1133 | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{u}_3\gamma^\mu u_3 ight)$       | R            |
| lu_1211 | $\left(ar{\ell}_1\gamma_{\mu}\ell_2 ight)\left(ar{u}_1\gamma^{\mu}u_1 ight)$    | $\mathbf{C}$ |
| lu_1212 | $\left(ar{\ell}_1\gamma_{\mu}\ell_2 ight)\left(ar{u}_1\gamma^{\mu}u_2 ight)$    | $\mathbf{C}$ |
| lu_1213 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{u}_1\gamma^\mu u_3 ight)$       | $\mathbf{C}$ |
| lu_1221 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{u}_2\gamma^\mu u_1 ight)$       | $\mathbf{C}$ |
| lu_1222 | $\left(ar{\ell}_1\gamma_{\mu}\ell_2 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$    | $\mathbf{C}$ |
| lu_1223 | $\left(ar{\ell}_1\gamma_{\mu}\ell_2 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$    | $\mathbf{C}$ |
| lu_1231 | $\left(ar{\ell}_1\gamma_\mu\ell_2\right)\left(ar{u}_3\gamma^\mu u_1 ight)$      | $\mathbf{C}$ |
| lu_1232 | $\left(\bar{\ell}_1\gamma_\mu\ell_2\right)\left(\bar{u}_3\gamma^\mu u_2\right)$ | $\mathbf{C}$ |
| lu_1233 | $\left(ar{\ell}_1\gamma_\mu\ell_2 ight)\left(ar{u}_3\gamma^\mu u_3 ight)$       | $\mathbf{C}$ |
| lu_1311 | $\left(\bar{\ell}_1\gamma_\mu\ell_3\right)\left(\bar{u}_1\gamma^\mu u_1 ight)$  | $\mathbf{C}$ |
| lu_1312 | $\left(ar{\ell}_1\gamma_{\mu}\ell_3 ight)\left(ar{u}_1\gamma^{\mu}u_2 ight)$    | $\mathbf{C}$ |
| lu_1313 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{u}_1\gamma^\mu u_3 ight)$       | $\mathbf{C}$ |
| lu_1321 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{u}_2\gamma^\mu u_1 ight)$       | $\mathbf{C}$ |
| lu_1322 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{u}_2\gamma^\mu u_2 ight)$       | $\mathbf{C}$ |
| lu_1323 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{u}_2\gamma^\mu u_3 ight)$       | $\mathbf{C}$ |
| lu_1331 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{u}_3\gamma^\mu u_1 ight)$       | $\mathbf{C}$ |
| lu_1332 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{u}_3\gamma^\mu u_2 ight)$       | $\mathbf{C}$ |
| lu_1333 | $\left(ar{\ell}_1\gamma_\mu\ell_3 ight)\left(ar{u}_3\gamma^\mu u_3 ight)$       | $\mathbf{C}$ |
| lu_2211 | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{u}_1\gamma^\mu u_1 ight)$       | R            |
| lu_2212 | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{u}_1\gamma^\mu u_2 ight)$       | $\mathbf{C}$ |
| lu_2213 | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{u}_1\gamma^\mu u_3 ight)$       | $\mathbf{C}$ |
|         |   |              |

| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | WC name | Operator  | Type            |
|---|---------|---|-----------------|
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2222 | $(\bar{\ell}_2\gamma_\mu\ell_2)(\bar{u}_2\gamma^\mu u_2)$   | R               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2223 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2233 |   | R               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2311 | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{u}_1\gamma^\mu u_1 ight)$                               | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2312 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2313 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2321 | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{u}_2\gamma^\mu u_1 ight)$                               | С               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2322 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2323 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2331 | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{u}_3\gamma^\mu u_1 ight)$                               |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2332 | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{u}_3\gamma^\mu u_2 ight)$                               |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_2333 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_3311 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_3312 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{u}_1\gamma^\mu u_2 ight)$                               |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_3313 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{u}_1\gamma^\mu u_3 ight)$                               | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_3322 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{u}_2\gamma^\mu u_2 ight)$                               |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_3323 | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{u}_2\gamma^\mu u_3 ight)$                               | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lu_3333 |   | R               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1111 | $\left(ar{\ell}_1\gamma_\mu\ell_1 ight)\left(ar{d}_1\gamma^\mu d_1 ight)$                               |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1112 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1113 |   | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1122 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1123 |   | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1133 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1211 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1212 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1213 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1221 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1222 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1223 | \= · / \= /   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1231 |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1232 | $\left( ar{\ell}_1 \gamma_\mu \ell_2  ight) \left( ar{d}_3 \gamma^\mu d_2  ight)$                       |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | _       |   |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | ld_1311 | $\left( ar{\ell}_1 \gamma_\mu \ell_3  ight) \left( ar{d}_1 \gamma^\mu d_1  ight)$                       |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |         | $\left( \ell_1 \gamma_\mu \ell_3  ight) \left( d_1 \gamma^\mu d_2  ight)$                               |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |         | $\left( \underline{\ell}_{1}\gamma_{\mu}\ell_{3} ight) \left( \underline{d}_{1}\gamma^{\mu}d_{3} ight)$ |                 |
| 1d_1323 $(\bar{\ell}_1 \gamma_\mu \ell_3) (\bar{d}_2 \gamma^\mu d_3)$ C         1d_1331 $(\bar{\ell}_1 \gamma_\mu \ell_3) (\bar{d}_3 \gamma^\mu d_1)$ C         1d_1332 $(\bar{\ell}_1 \gamma_\mu \ell_3) (\bar{d}_3 \gamma^\mu d_2)$ C |         | $\left( \ell_1 \gamma_\mu \ell_3  ight) \left( d_2 \gamma^\mu d_1  ight)$                               |                 |
| ld_1331 $(\bar{\ell}_1 \gamma_\mu \ell_3) (\bar{d}_3 \gamma^\mu d_1)$ C<br>ld_1332 $(\bar{\ell}_1 \gamma_\mu \ell_3) (\bar{d}_3 \gamma^\mu d_2)$ C  |         | $\left( \ell_1 \gamma_\mu \ell_3 \right) \left( d_2 \gamma^\mu d_2 \right)$                             |                 |
| ld_1332 $\left(\bar{\ell}_1\gamma_\mu\ell_3\right)\left(\bar{d}_3\gamma^\mu d_2\right)$ C   |         | $\left(\ell_1\gamma_\mu\ell_3\right)\left(d_2\gamma^\mu d_3\right)$                                     |                 |
|   |         |   |                 |
| $(\ell_1 \gamma_\mu \ell_3) \left( d_3 \gamma^\mu d_3 \right) $ C   |         |   |                 |
|   | ld_1333 | $(\ell_1\gamma_\mu\ell_3)\ (d_3\gamma^\mu d_3)$   | С               |

| WC name            | Operator  | Type                          |
|--------------------|---|-------------------------------|
| ld_2211            | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{d}_1\gamma^\mu d_1 ight)$   | R                             |
| ld_2212            | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{d}_1\gamma^\mu d_2 ight)$   | С                             |
| ld_2213            | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{d}_1\gamma^\mu d_3 ight)$   | С                             |
| ld_2222            | $(ar{\ell}_2\gamma_\mu\ell_2)(ar{d}_2\gamma^\mu d_2)$   | R                             |
| ld_2223            | $(ar{\ell}_2\gamma_\mu\ell_2)(ar{d}_2\gamma^\mu d_3)$   | С                             |
| ld_2233            | $\left(ar{\ell}_2\gamma_\mu\ell_2 ight)\left(ar{d}_3\gamma^\mu d_3 ight)$   | R                             |
| ld_2311            | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{d}_1\gamma^\mu d_1)$   | С                             |
| ld_2312            | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{d}_1\gamma^\mu d_2 ight)$   | С                             |
| ld_2313            | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{d}_1\gamma^\mu d_3 ight)$   | С                             |
| ld_2321            | $(ar{\ell}_2\gamma_\mu\ell_3)(ar{d}_2\gamma^\mu d_1)$   | С                             |
| ld_2322            | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{d}_2\gamma^\mu d_2 ight)$   | $\mathbf{C}$                  |
| ld_2323            | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{d}_2\gamma^\mu d_3 ight)$   | С                             |
| ld_2331            | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{d}_3\gamma^\mu d_1 ight)$   | С                             |
| ld_2332            | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{d}_3\gamma^\mu d_2 ight)$   | С                             |
| ld_2333            | $\left(ar{\ell}_2\gamma_\mu\ell_3 ight)\left(ar{d}_3\gamma^\mu d_3 ight)$   | С                             |
| ld_3311            | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{d}_1\gamma^\mu d_1 ight)$   | R                             |
| ld_3312            | $(ar{\ell}_3\gamma_\mu\ell_3)(ar{d}_1\gamma^\mu d_2)$   | С                             |
| ld_3313            | $(ar{\ell}_3\gamma_\mu\ell_3)(ar{d}_1\gamma^\mu d_3)$   | С                             |
| ld_3322            | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{d}_2\gamma^\mu d_2 ight)$   | R                             |
| ld_3323            | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{d}_2\gamma^\mu d_3 ight)$   | С                             |
| ld_3333            | $\left(ar{\ell}_3\gamma_\mu\ell_3 ight)\left(ar{d}_3\gamma^\mu d_3 ight)$   | R                             |
| qe_1111            | $(\bar{q}_1\gamma_\mu q_1)(\bar{e}_1\gamma^\mu e_1)$  | R                             |
| qe_1112            | $(ar{q}_1\gamma_\mu q_1)(ar{e}_1\gamma^\mu e_2)$  | $\mathbf{C}$                  |
| qe_1113            | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{e}_1\gamma^{\mu}e_3 ight)$  | С                             |
| qe_1122            | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{e}_2\gamma^{\mu}e_2 ight)$  | R                             |
| qe_1123            | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{e}_2\gamma^{\mu}e_3 ight)$  | С                             |
| qe_1133            | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{e}_3\gamma^{\mu}e_3 ight)$  | R                             |
| qe_1211            | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{e}_1\gamma^{\mu}e_1 ight)$  | C                             |
| qe_1212            | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{e}_1\gamma^{\mu}e_2 ight)$  | C                             |
| qe_1213            | $(ar{q}_1\gamma_\mu q_2)(ar{e}_1\gamma^\mu e_3)$  | $\stackrel{	ext{C}}{\sim}$    |
| qe_1221            | $(ar{q}_1\gamma_\mu q_2)(ar{e}_2\gamma^\mu e_1)$  | $\stackrel{	ext{C}}{	ext{c}}$ |
| qe_1222            | $(ar{q}_1\gamma_\mu q_2)(ar{e}_2\gamma^\mu e_2)$  | С                             |
| qe_1223            | $(\bar{q}_1\gamma_\mu q_2)(\bar{e}_2\gamma^\mu e_3)$  | С                             |
| qe_1231            | $(\bar{q}_1\gamma_\mu q_2)(\bar{e}_3\gamma^\mu e_1)$  | С                             |
| qe_1232            | $(\bar{q}_1\gamma_\mu q_2)(\bar{e}_3\gamma^\mu e_2)$  | С                             |
| qe_1233            | $(\bar{q}_1\gamma_\mu q_2)(\bar{e}_3\gamma^\mu e_3)$  | C<br>C                        |
| qe_1311<br>qe_1312 | $egin{aligned} \left(ar{q}_1\gamma_\mu q_3 ight)\left(ar{e}_1\gamma^\mu e_1 ight) \ \left(ar{q}_1\gamma_\mu q_3 ight)\left(ar{e}_1\gamma^\mu e_2 ight) \end{aligned}$ | C                             |
| qe_1312<br>qe_1313 | $(q_1\gamma_\mu q_3) \left(\overline{e}_1\gamma^\mu \overline{e}_2 ight) \ \left(\overline{q}_1\gamma_\mu q_3 ight) \left(\overline{e}_1\gamma^\mu e_3 ight)$         | C                             |
| qe_1313<br>qe_1321 | $(q_1\gamma_\mu q_3) \left(e_1\gamma^\mu e_3 ight) \ (ar q_1\gamma_\mu q_3) \left(ar e_2\gamma^\mu e_1 ight)$   | C                             |
| qe_1321<br>qe_1322 | $\left(ar{q}_1\gamma_{\mu}q_3 ight)\left(ar{e}_2\gamma^{\mu}e_1 ight) \ \left(ar{q}_1\gamma_{\mu}q_3 ight)\left(ar{e}_2\gamma^{\mu}e_2 ight)$                         | C                             |
| qe_1323            | $egin{array}{l} (q_1\gamma_\mu q_3)(e_2\gamma^-e_2) \ (ar q_1\gamma_\mu q_3)(ar e_2\gamma^\mu e_3) \end{array}$   | C                             |
| qe_1331            | $egin{array}{l} (q_1\gamma_\mu q_3)(e_2\gamma^-e_3) \ (ar q_1\gamma_\mu q_3)(ar e_3\gamma^\mu e_1) \end{array}$   | C                             |
| 4~_1001            | $(41/\mu43)(C3/C1)$   | C                             |

| WC name  | Operator   | Type                       |
|----------|--|----------------------------|
| qe_1332  | $\left(ar{q}_1\gamma_{\mu}q_3 ight)\left(ar{e}_3\gamma^{\mu}e_2 ight)$                                       | С                          |
| qe_1333  | $(ar{q}_1\gamma_\mu q_3)(ar{e}_3\gamma^\mu e_3)$   | $\mathbf{C}$               |
| qe_2211  | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{e}_1\gamma^{\mu}e_1 ight)$                                       | R                          |
| qe_2212  | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{e}_1\gamma^{\mu}e_2 ight)$                                       | $\mathbf{C}$               |
| qe_2213  | $(ar{q}_2\gamma_\mu q_2)(ar{e}_1\gamma^\mu e_3)$   | $\mathbf{C}$               |
| qe_2222  | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{e}_2\gamma^{\mu}e_2 ight)$                                       | R                          |
| qe_2223  | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{e}_2\gamma^{\mu}e_3 ight)$                                       | $\mathbf{C}$               |
| qe_2233  | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{e}_3\gamma^{\mu}e_3 ight)$                                       | R                          |
| qe_2311  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_1\gamma^{\mu}e_1 ight)$                                       | $^{\mathrm{C}}$            |
| qe_2312  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_1\gamma^{\mu}e_2 ight)$                                       | $^{\mathrm{C}}$            |
| qe_2313  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_1\gamma^{\mu}e_3 ight)$                                       | $^{\mathrm{C}}$            |
| qe_2321  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_2\gamma^{\mu}e_1 ight)$                                       | $\mathbf{C}$               |
| qe_2322  | $(ar{q}_2\gamma_\mu q_3)(ar{e}_2\gamma^\mu e_2)$   | $^{\mathrm{C}}$            |
| qe_2323  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_2\gamma^{\mu}e_3 ight)$                                       | $\mathbf{C}$               |
| qe_2331  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_3\gamma^{\mu}e_1 ight)$                                       | $^{\mathrm{C}}$            |
| qe_2332  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_3\gamma^{\mu}e_2 ight)$                                       | $^{\mathrm{C}}$            |
| qe_2333  | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{e}_3\gamma^{\mu}e_3 ight)$                                       | $^{\mathrm{C}}$            |
| qe_3311  | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{e}_1\gamma^{\mu}e_1 ight)$                                       | R                          |
| qe_3312  | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{e}_1\gamma^{\mu}e_2 ight)$                                       | $\mathbf{C}$               |
| qe_3313  | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{e}_1\gamma^{\mu}e_3 ight)$                                       | $\mathbf{C}$               |
| qe_3322  | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{e}_2\gamma^{\mu}e_2 ight)$                                       | R                          |
| qe_3323  | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{e}_2\gamma^{\mu}e_3 ight)$                                       | С                          |
| qe_3333  | $(ar{q}_3\gamma_\mu q_3)(ar{e}_3\gamma^\mu e_3)$   | R                          |
| qu1_1111 | $(\bar{q}_1\gamma_\mu q_1)(\bar{u}_1\gamma^\mu u_1)$   | R                          |
| qu1_1112 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{u}_1\gamma^{\mu}u_2 ight)$                                       | $\stackrel{	ext{C}}{\sim}$ |
| qu1_1113 | $(\bar{q}_1\gamma_\mu q_1)(\bar{u}_1\gamma^\mu u_3)$   | С                          |
| qu1_1122 | $(\bar{q}_1\gamma_\mu q_1)(\bar{u}_2\gamma^\mu u_2)$   | R                          |
| qu1_1123 | $(\bar{q}_1\gamma_\mu q_1)(\bar{u}_2\gamma^\mu u_3)$   | С                          |
| qu1_1133 | $(\bar{q}_1\gamma_\mu q_1)(\bar{u}_3\gamma^\mu u_3)$   | R                          |
| qu1_1211 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_1\gamma^\mu u_1)$   | С                          |
| qu1_1212 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_1\gamma^\mu u_2)$   | С                          |
| qu1_1213 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_1\gamma^\mu u_3)$   | С                          |
| qu1_1221 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_2\gamma^\mu u_1)$   | С                          |
| qu1_1222 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_2\gamma^\mu u_2)$   | С                          |
| qu1_1223 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_2\gamma^\mu u_3)$   | C<br>C                     |
| qu1_1231 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_3\gamma^\mu u_1)$   | -                          |
| qu1_1232 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_3\gamma^\mu u_2)$   | C<br>C                     |
| qu1_1233 | $(\bar{q}_1\gamma_\mu q_2)(\bar{u}_3\gamma^\mu u_3)$   | C                          |
| qu1_1311 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_1\gamma^\mu u_1)$   | C                          |
| qu1_1312 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_1\gamma^\mu u_2)$   | C                          |
| qu1_1313 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_1\gamma^\mu u_3)$   | C                          |
| qu1_1321 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_2\gamma^\mu u_1)$   | C                          |
| qu1_1322 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_2\gamma^\mu u_2)$<br>$(\bar{q}_1\gamma_\mu q_3)(\bar{q}_2\gamma^\mu u_2)$ | C                          |
| qu1_1323 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_2\gamma^\mu u_3)$   | C                          |

| WC name  | Operator   | Type                                  |
|----------|--|---------------------------------------|
|          |  |                                       |
| qu1_1331 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_3\gamma^\mu u_1)$                         | $^{ m C}_{ m C}$                      |
| qu1_1332 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_3\gamma^\mu u_2)$                         |                                       |
| qu1_1333 | $(\bar{q}_1\gamma_\mu q_3)(\bar{u}_3\gamma^\mu u_3)$                         | С                                     |
| qu1_2211 | $(ar{q}_2\gamma_\mu q_2)(ar{u}_1\gamma^\mu u_1)$                             | R                                     |
| qu1_2212 | $(ar{q}_2\gamma_\mu q_2)(ar{u}_1\gamma^\mu u_2)$                             | C                                     |
| qu1_2213 | $(\bar{q}_2\gamma_\mu q_2)(\bar{u}_1\gamma^\mu u_3)$                         | С                                     |
| qu1_2222 | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$       | R                                     |
| qu1_2223 | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$       | С                                     |
| qu1_2233 | $(ar{q}_2\gamma_\mu q_2)(ar{u}_3\gamma^\mu u_3)$                             | R                                     |
| qu1_2311 | $(ar{q}_2\gamma_\mu q_3)(ar{u}_1\gamma^\mu u_1)$                             | C                                     |
| qu1_2312 | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{u}_1\gamma^{\mu}u_2 ight)$       | C                                     |
| qu1_2313 | $(ar{q}_2\gamma_\mu q_3)(ar{u}_1\gamma^\mu u_3)$                             | $\overset{	ext{C}}{\widetilde{\sim}}$ |
| qu1_2321 | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{u}_2\gamma^{\mu}u_1 ight)$       | C                                     |
| qu1_2322 | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$       | C                                     |
| qu1_2323 | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$       | C                                     |
| qu1_2331 | $\left(\bar{q}_2\gamma_{\mu}q_3\right)\left(\bar{u}_3\gamma^{\mu}u_1\right)$ | C                                     |
| qu1_2332 | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{u}_3\gamma^{\mu}u_2 ight)$       | $^{\mathrm{C}}$                       |
| qu1_2333 | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$       | $\mathbf{C}$                          |
| qu1_3311 | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{u}_1\gamma^{\mu}u_1 ight)$       | R                                     |
| qu1_3312 | $\left(\bar{q}_3\gamma_{\mu}q_3\right)\left(\bar{u}_1\gamma^{\mu}u_2\right)$ | $^{\mathrm{C}}$                       |
| qu1_3313 | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{u}_1\gamma^{\mu}u_3 ight)$       | $^{\mathrm{C}}$                       |
| qu1_3322 | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{u}_2\gamma^{\mu}u_2 ight)$       | R                                     |
| qu1_3323 | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{u}_2\gamma^{\mu}u_3 ight)$       | $\mathbf{C}$                          |
| qu1_3333 | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{u}_3\gamma^{\mu}u_3 ight)$       | R                                     |
| qd1_1111 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(d_1\gamma^{\mu}d_1 ight)$           | R                                     |
| qd1_1112 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$       | $\mathbf{C}$                          |
| qd1_1113 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$       | $^{\mathrm{C}}$                       |
| qd1_1122 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$       | R                                     |
| qd1_1123 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$       | $^{\mathrm{C}}$                       |
| qd1_1133 | $\left(ar{q}_1\gamma_{\mu}q_1 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$       | R                                     |
| qd1_1211 | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{d}_1\gamma^{\mu}d_1 ight)$       | $^{\mathrm{C}}$                       |
| qd1_1212 | $(ar{q}_1\gamma_{\mu}q_2)\left(ar{d}_1\gamma^{\mu}d_2 ight)$                 | $^{\mathrm{C}}$                       |
| qd1_1213 | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$       | $^{\mathrm{C}}$                       |
| qd1_1221 | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{d}_2\gamma^{\mu}d_1 ight)$       | $^{\mathrm{C}}$                       |
| qd1_1222 | $\left(ar{q}_1\gamma_{\mu}q_2 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$       | $^{\mathrm{C}}$                       |
| qd1_1223 | $(ar{q}_1\gamma_{\mu}q_2)\left(ar{d}_2\gamma^{\mu}d_3 ight)$                 | $^{\mathrm{C}}$                       |
| qd1_1231 | $(ar{q}_1\gamma_\mu q_2)\left(ar{d}_3\gamma^\mu d_1 ight)$                   | $^{\mathrm{C}}$                       |
| qd1_1232 | $(ar{q}_1\gamma_\mu q_2)\left(ar{d}_3\gamma^\mu d_2 ight)$                   | $^{\mathrm{C}}$                       |
| qd1_1233 | $(ar{q}_1\gamma_\mu q_2)\left(ar{d}_3\gamma^\mu d_3 ight)$                   | $\mathbf{C}$                          |
| qd1_1311 | $(ar{q}_1\gamma_\mu q_3) \left(ar{d}_1\gamma^\mu d_1 ight)$                  | $\mathbf{C}$                          |
| qd1_1312 | $(ar{q}_1\gamma_\mu q_3) \left(ar{d}_1\gamma^\mu d_2 ight)$                  | $\mathbf{C}$                          |
| qd1_1313 | $(ar{q}_1\gamma_\mu q_3) \left(ar{d}_1\gamma^\mu d_3 ight)$                  | C                                     |
| qd1_1321 | $(ar{q}_1\gamma_\mu q_3) \left(ar{d}_2\gamma^\mu d_1 ight)$                  | C                                     |
| <u> </u> | (11 /µ 10) ( 12 / 11)  | ~                                     |

| WC name              | Operator  | Type                          |
|----------------------|---|-------------------------------|
| qd1_1322             | $(\bar{q}_1\gamma_\mu q_3) \left(\bar{d}_2\gamma^\mu d_2\right)$  | С                             |
| qd1_1323             | $(ar{q}_1\gamma_\mu q_3) \left(ar{d}_2\gamma^\mu d_3 ight)$   | $\mathbf{C}$                  |
| qd1_1331             | $(ar{q}_1\gamma_\mu q_3) \left(ar{d}_3\gamma^\mu d_1 ight)$   | $\mathbf{C}$                  |
| qd1_1332             | $(ar{q}_1\gamma_{\mu}q_3)\left(ar{d}_3\gamma^{\mu}d_2 ight)$  | $\mathbf{C}$                  |
| qd1_1333             | $(ar{q}_1\gamma_{\mu}q_3)\left(ar{d}_3\gamma^{\mu}d_3 ight)$  | $\mathbf{C}$                  |
| qd1_2211             | $(ar{q}_2\gamma_\mu q_2)\left(ar{d}_1\gamma^\mu d_1 ight)$  | ${ m R}$                      |
| qd1_2212             | $(ar{q}_2\gamma_\mu q_2) \left(ar{d}_1\gamma^\mu d_2 ight)$   | $\mathbf{C}$                  |
| qd1_2213             | $(ar{q}_2\gamma_\mu q_2)\left(ar{d}_1\gamma^\mu d_3 ight)$  | $^{\mathrm{C}}$               |
| qd1_2222             | $(ar{q}_2\gamma_\mu q_2)\left(ar{d}_2\gamma^\mu d_2 ight)$  | R                             |
| qd1_2223             | $(ar{q}_2\gamma_\mu q_2)ig(ar{d}_2\gamma^\mu d_3ig)$  | $^{\mathrm{C}}$               |
| qd1_2233             | $\left(ar{q}_2\gamma_{\mu}q_2 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$  | R                             |
| qd1_2311             | $(ar{q}_2\gamma_\mu q_3)\left(ar{d}_1\gamma^\mu d_1 ight)$  | $^{\mathrm{C}}$               |
| qd1_2312             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$  | $^{\mathrm{C}}$               |
| qd1_2313             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$  | $^{\mathrm{C}}$               |
| qd1_2321             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_2\gamma^{\mu}d_1 ight)$  | $^{\mathrm{C}}$               |
| qd1_2322             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_2\gamma^{\mu}d_2 ight)$  | $^{\mathrm{C}}$               |
| qd1_2323             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_2\gamma^{\mu}d_3 ight)$  | $^{\mathrm{C}}$               |
| qd1_2331             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_3\gamma^{\mu}d_1 ight)$  | $^{\mathrm{C}}$               |
| qd1_2332             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_3\gamma^{\mu}d_2 ight)$  | $^{\mathrm{C}}$               |
| qd1_2333             | $\left(ar{q}_2\gamma_{\mu}q_3 ight)\left(ar{d}_3\gamma^{\mu}d_3 ight)$  | $^{\mathrm{C}}$               |
| qd1_3311             | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{d}_1\gamma^{\mu}d_1 ight)$  | R                             |
| qd1_3312             | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{d}_1\gamma^{\mu}d_2 ight)$  | $^{\mathrm{C}}$               |
| qd1_3313             | $\left(ar{q}_3\gamma_{\mu}q_3 ight)\left(ar{d}_1\gamma^{\mu}d_3 ight)$  | $^{\mathrm{C}}$               |
| qd1_3322             | $(ar{q}_3\gamma_{\mu}q_3)\left(ar{d}_2\gamma^{\mu}d_2 ight)$  | R                             |
| qd1_3323             | $(ar{q}_3\gamma_{\mu}q_3)\left(ar{d}_2\gamma^{\mu}d_3 ight)$  | $^{\mathrm{C}}$               |
| qd1_3333             | $(ar{q}_3\gamma_\mu q_3) \left(ar{d}_3\gamma^\mu d_3 ight)$   | R                             |
| qu8_1111             | $\left(ar{q}_1\gamma_{\mu}T^A_{q_1} ight)\left(ar{u}_1\gamma^{\mu}T^A_{u_1} ight)$  | R                             |
| qu8_1112             | $\left( \bar{q}_1 \gamma_\mu T^A q_1 \right) \left( \bar{u}_1 \gamma^\mu T^A u_2 \right)$   | C                             |
| qu8_1113             | $\left( ar{q}_1 \gamma_\mu T^A q_1 \right) \left( ar{u}_1 \gamma^\mu T^A u_3 \right)$   | С                             |
| qu8_1122             | $\left\langle \bar{q}_1 \gamma_\mu T^A q_1 \right\rangle \left\langle \bar{u}_2 \gamma^\mu T^A u_2 \right\rangle$   | R                             |
| qu8_1123             | $\left\langle \bar{q}_1 \gamma_\mu T^A q_1 \right\rangle \left\langle \bar{u}_2 \gamma^\mu T^A u_3 \right\rangle$   | С                             |
| qu8_1133             | $\left(\bar{q}_1\gamma_{\mu}T^Aq_1\right)\left(\bar{u}_3\gamma^{\mu}T^Au_3\right)$  | R                             |
| qu8_1211             | $egin{aligned} \left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{u}_1\gamma^\mu T^Au_1 ight) \ \left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{u}_1\gamma^\mu T^Au_2 ight) \end{aligned}$ | C<br>C                        |
| qu8_1212             | $egin{aligned} \left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{u}_1\gamma^\mu T^Au_2 ight) \ \left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{u}_1\gamma^\mu T^Au_3 ight) \end{aligned}$ | C                             |
| qu8_1213<br>qu8_1221 | $egin{pmatrix} \left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{u}_1\gamma^\mu T^Au_3 ight) \ \left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{u}_2\gamma^\mu T^Au_1 ight) \end{pmatrix}$ | C                             |
| qu8_1222             | $egin{pmatrix} (q_1)_{\mu 1} & q_2 \end{pmatrix} (u_2)_{\Gamma} & T & u_1 \end{pmatrix} \ (ar{q}_1 \gamma_{\mu} T^A q_2) & (ar{u}_2 \gamma^{\mu} T^A u_2) \end{pmatrix}$          | C                             |
| qu8_1223             | $egin{pmatrix} (q_1)_\mu \Gamma & q_2 \end{pmatrix} ig(ar{q}_1 \gamma_\mu \Gamma^A q_2 ig) ig(ar{u}_2 \gamma^\mu \Gamma^A u_3 ig) \end{pmatrix}$                                  | C                             |
| qu8_1231             | $egin{array}{l} (ar{q}_1\gamma_\mu \Gamma^A q_2) & (ar{a}_2\gamma^\mu \Gamma^A u_1) \ (ar{q}_1\gamma_\mu \Gamma^A q_2) & (ar{u}_3\gamma^\mu \Gamma^A u_1) \end{array}$            | C                             |
| qu8_1232             | $egin{array}{l} (ar{q}_1\gamma_\mu T^Aq_2) & (ar{a}_3\gamma^\mu T^Au_2) \ (ar{q}_1\gamma_\mu T^Aq_2) & (ar{u}_3\gamma^\mu T^Au_2) \end{array}$                                    | $\overset{\circ}{\mathrm{C}}$ |
| qu8_1233             | $egin{array}{l} (ar{q}_1\gamma_\mu T^Aq_2) & (ar{u}_3\gamma^\mu T^Au_3) \ (ar{q}_1\gamma_\mu T^Aq_2) & (ar{u}_3\gamma^\mu T^Au_3) \end{array}$                                    | $\overset{\circ}{\mathrm{C}}$ |
| qu8_1311             | $egin{pmatrix} (ar{q}_1\gamma_\mu\Gamma^Aq_2) & (ar{a}_3\gamma^\mu\Gamma^Aq_3) \ (ar{u}_1\gamma^\mu\Gamma^Au_1) \end{pmatrix}$  | $\overset{\circ}{\mathrm{C}}$ |
| qu8_1312             | $egin{pmatrix} ar{(ar{q}_1\gamma_\mu T^Aq_3)} & ar{(ar{u}_1\gamma^\mu T^Au_2)} \end{pmatrix}$   | C                             |
|                      | · · · · · · /   |                               |

| WC name  | Operator  | Type                          |
|----------|---|-------------------------------|
| qu8_1313 | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_1\gamma^{\mu}T^Au_3 ight)$  | C                             |
| qu8_1321 | $(\bar{q}_1\gamma_\mu T^Aq_3)(\bar{u}_2\gamma^\mu T^Au_1)$  | $^{\mathrm{C}}$               |
| qu8_1322 | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_2\gamma^{\mu}T^Au_2 ight)$  | $^{\mathrm{C}}$               |
| qu8_1323 | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_2\gamma^{\mu}T^Au_3 ight)$  | $^{\mathrm{C}}$               |
| qu8_1331 | $(ar{q}_1\gamma_\mu T^Aq_3)~(ar{u}_3\gamma^\mu T^Au_1)$   | $^{\mathrm{C}}$               |
| qu8_1332 | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_3\gamma^{\mu}T^Au_2 ight)$  | $\mathbf{C}$                  |
| qu8_1333 | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_3\gamma^{\mu}T^Au_3 ight)$  | $^{\mathrm{C}}$               |
| qu8_2211 | $\left(ar{q}_2\gamma_{\mu}T^Aq_2 ight)\left(ar{u}_1\gamma^{\mu}T^Au_1 ight)$  | R                             |
| qu8_2212 | $\left(ar{q}_2\gamma_{\mu}T^Aq_2 ight)\left(ar{u}_1\gamma^{\mu}T^Au_2 ight)$  | $\mathbf{C}$                  |
| qu8_2213 | $\left(ar{q}_2\gamma_{\mu}T^Aq_2 ight)\left(ar{u}_1\gamma^{\mu}T^Au_3 ight)$  | $\mathbf{C}$                  |
| qu8_2222 | $\left(ar{q}_2\gamma_{\mu}T^Aq_2 ight)\left(ar{u}_2\gamma^{\mu}T^Au_2 ight)$  | R                             |
| qu8_2223 | $\left(ar{q}_2\gamma_{\mu}T^Aq_2 ight)\left(ar{u}_2\gamma^{\mu}T^Au_3 ight)$  | $^{\mathrm{C}}$               |
| qu8_2233 | $\left(ar{q}_2\gamma_{\mu}T^Aq_2 ight)\left(ar{u}_3\gamma^{\mu}T^Au_3 ight)$  | R                             |
| qu8_2311 | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_1\gamma^{\mu}T^Au_1 ight)$  | $^{\mathrm{C}}$               |
| qu8_2312 | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_1\gamma^{\mu}T^Au_2 ight)$  | $^{\mathrm{C}}$               |
| qu8_2313 | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_1\gamma^{\mu}T^Au_3 ight)$  | $^{\mathrm{C}}$               |
| qu8_2321 | $\left(ar{q}_2\gamma_\mu T^Aq_3 ight)\left(ar{u}_2\gamma^\mu T^Au_1 ight)$  | $^{\mathrm{C}}$               |
| qu8_2322 | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_2\gamma^{\mu}T^Au_2 ight)$  | $^{\mathrm{C}}$               |
| qu8_2323 | $\left(ar{q}_2\gamma_\mu T^Aq_3 ight)\left(ar{u}_2\gamma^\mu T^Au_3 ight)$  | $^{\mathrm{C}}$               |
| qu8_2331 | $(ar{q}_2\gamma_\mu T^Aq_3)~(ar{u}_3\gamma^\mu T^Au_1)$   | $^{\mathrm{C}}$               |
| qu8_2332 | $\left(ar{q}_2\gamma_\mu T^Aq_3 ight)\left(ar{u}_3\gamma^\mu T^Au_2 ight)$  | $^{\mathrm{C}}$               |
| qu8_2333 | $(ar{q}_2\gamma_\mu T^Aq_3)~(ar{u}_3\gamma^\mu T^Au_3)$   | $\mathbf{C}$                  |
| qu8_3311 | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_1\gamma^{\mu}T^Au_1 ight)$  | ${ m R}$                      |
| qu8_3312 | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_1\gamma^{\mu}T^Au_2 ight)$  | $^{\mathrm{C}}$               |
| qu8_3313 | $\left(ar{q}_3\gamma_{\mu}T^Aq_3\right)\left(ar{u}_1\gamma^{\mu}T^Au_3\right)$  | $^{\mathrm{C}}$               |
| qu8_3322 | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_2\gamma^{\mu}T^Au_2 ight)$  | ${ m R}$                      |
| qu8_3323 | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{u}_2\gamma^{\mu}T^Au_3 ight)$  | $\mathbf{C}$                  |
| qu8_3333 | $\left(ar{q}_3\gamma_\mu T^Aq_3 ight)\left(ar{u}_3\gamma^\mu T^Au_3 ight)$  | R                             |
| qd8_1111 | $\left(ar{q}_1\gamma_{\mu}T^Aq_1 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_1 ight)$  | ${ m R}$                      |
| qd8_1112 | $\left(ar{q}_1\gamma_{\mu}T^Aq_1 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_2 ight)$  | $^{\mathrm{C}}$               |
| qd8_1113 | $\left(ar{q}_1\gamma_{\mu}T^Aq_1 ight)\left(d_1\gamma^{\mu}T^Ad_3 ight)$  | $^{\mathrm{C}}$               |
| qd8_1122 | $\left(ar{q}_1\gamma_{\mu}T^Aq_1 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_2 ight)$  | R                             |
| qd8_1123 | $\left(ar{q}_1\gamma_\mu T^Aq_1 ight)\left(ar{d}_2\gamma^\mu T^Ad_3 ight)$  | $\mathbf{C}$                  |
| qd8_1133 | $\left(ar{q}_1\gamma_{\mu}T^Aq_1 ight)\left(ar{d}_3\gamma^{\mu}T^Ad_3 ight)$  | ${ m R}$                      |
| qd8_1211 | $\left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{d}_1\gamma^\mu T^Ad_1 ight)$  | $\mathbf{C}$                  |
| qd8_1212 | $\left\langle ar{q}_1\gamma_{\mu}T^Aq_2 ight angle \left\langle ar{d}_1\gamma^{\mu}T^Ad_2 ight angle$   | $\mathbf{C}$                  |
| qd8_1213 | $\left(ar{q}_1\gamma_{\mu}T^Aq_2 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_3 ight)$  | $^{\mathrm{C}}$               |
| qd8_1221 | $\left(ar{q}_1\gamma_{\mu}T^Aq_2 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_1 ight)$  | $\mathbf{C}$                  |
| qd8_1222 | $egin{pmatrix} (ar{q}_1\gamma_\mu T^Aq_2) & (ar{d}_2\gamma^\mu T^Ad_2) \ \end{pmatrix}$   | $\dot{	ext{C}}$               |
| qd8_1223 | $egin{pmatrix} (ar{q}_1\gamma_\mu T^Aq_2) & (ar{d}_2\gamma^\mu T^Ad_3) \end{pmatrix}$   | $\overset{\circ}{\mathrm{C}}$ |
| qd8_1231 | $egin{array}{l} (q_1)_{\mu 1} & q_2) & (a_2)_1 & a_3) \ (ar{q}_1 \gamma_{\mu} T^A q_2) & (ar{d}_3 \gamma^{\mu} T^A d_1) \end{array}$  | $\overset{\circ}{\mathrm{C}}$ |
| qd8_1232 | $egin{array}{c} (q_1)_\mu \Gamma^A q_2 \end{pmatrix} (ar{d}_3 \gamma^\mu \Gamma^A d_2) \ (ar{q}_1 \gamma_\mu \Gamma^A q_2) \ (ar{d}_3 \gamma^\mu \Gamma^A d_2) \end{array}$ | $\overset{\circ}{\mathrm{C}}$ |
| qd8_1233 | $\left(ar{q}_1\gamma_\mu T^Aq_2 ight)\left(ar{d}_3\gamma^\mu T^Ad_3 ight) \left(ar{d}_3\gamma^\mu T^Ad_3 ight)$   | C                             |
| quo_1233 | $(q_1, \gamma_{\mu}, q_2)$ $(a_3, \gamma, q_1, a_3)$  | C                             |

| WC name   | Operator   | Type            |
|-----------|--|-----------------|
| qd8_1311  | $\left(ar{q}_1\gamma_\mu T^A q_3\right) \left(ar{d}_1\gamma^\mu T^A d_1\right)$          | С               |
| qd8_1312  | $(\bar{q}_1\gamma_\mu T^Aq_3)(\bar{d}_1\gamma^\mu T^Ad_2)$                               | $^{\mathrm{C}}$ |
| qd8_1313  | $\left(ar{q}_1\gamma_\mu T^Aq_3 ight)\left(ar{d}_1\gamma^\mu T^Ad_3 ight)$               | $^{\mathrm{C}}$ |
| qd8_1321  | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_1 ight)$             | $\mathbf{C}$    |
| qd8_1322  | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_2 ight)$             | $^{\mathrm{C}}$ |
| qd8_1323  | $\left(ar{q}_{1}\gamma_{\mu}T^{A}q_{3} ight)\left(ar{d}_{2}\gamma^{\mu}T^{A}d_{3} ight)$ | $\mathbf{C}$    |
| qd8_1331  | $\left(ar{q}_1\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_3\gamma^{\mu}T^Ad_1 ight)$             | $\mathbf{C}$    |
| qd8_1332  | $\left( ar{q}_1 \gamma_\mu T^A q_3 \right) \left( ar{d}_3 \gamma^\mu T^A d_2 \right)$    | $^{\mathrm{C}}$ |
| qd8_1333  | $\left(ar{q}_1\gamma_\mu T^Aq_3 ight)\left(ar{d}_3\gamma^\mu T^Ad_3 ight)$               | $\mathbf{C}$    |
| qd8_2211  | $(\bar{q}_2\gamma_\mu T^Aq_2)(\bar{d}_1\gamma^\mu T^Ad_1)$                               | R               |
| qd8_2212  | $\left(ar{q}_2\gamma_\mu T^Aq_2 ight)\left(ar{d}_1\gamma^\mu T^Ad_2 ight)$               | $^{\mathrm{C}}$ |
| qd8_2213  | $\left(ar{q}_2\gamma_\mu T^Aq_2 ight)\left(ar{d}_1\gamma^\mu T^Ad_3 ight)$               | $^{\mathrm{C}}$ |
| qd8_2222  | $\left(ar{q}_2\gamma_\mu T^Aq_2 ight)\left(ar{d}_2\gamma^\mu T^Ad_2 ight)$               | R               |
| qd8_2223  | $\left(ar{q}_2\gamma_\mu T^Aq_2 ight)\left(ar{d}_2\gamma^\mu T^Ad_3 ight)$               | $^{\mathrm{C}}$ |
| qd8_2233  | $\left(ar{q}_2\gamma_\mu T^Aq_2 ight)\left(ar{d}_3\gamma^\mu T^Ad_3 ight)$               | ${ m R}$        |
| qd8_2311  | $\left(ar{q}_2\gamma_\mu T^Aq_3 ight)\left(ar{d}_1\gamma^\mu T^Ad_1 ight)$               | $^{\mathrm{C}}$ |
| qd8_2312  | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_2 ight)$             | $^{\mathrm{C}}$ |
| qd8_2313  | $\left(ar{q}_2\gamma_\mu T^Aq_3 ight)\left(ar{d}_1\gamma^\mu T^Ad_3 ight)$               | $^{\mathrm{C}}$ |
| qd8_2321  | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_1 ight)$             | $^{\mathrm{C}}$ |
| qd8_2322  | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_2 ight)$             | $\mathbf{C}$    |
| qd8_2323  | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_3 ight)$             | $\mathbf{C}$    |
| qd8_2331  | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_3\gamma^{\mu}T^Ad_1 ight)$             | $\mathbf{C}$    |
| qd8_2332  | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_3\gamma^{\mu}T^Ad_2 ight)$             | $\mathbf{C}$    |
| qd8_2333  | $\left(ar{q}_2\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_3\gamma^{\mu}T^Ad_3 ight)$             | $\mathbf{C}$    |
| qd8_3311  | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_1 ight)$             | R               |
| qd8_3312  | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_2 ight)$             | $\mathbf{C}$    |
| qd8_3313  | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_1\gamma^{\mu}T^Ad_3 ight)$             | $\mathbf{C}$    |
| qd8_3322  | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_2 ight)$             | R               |
| qd8_3323  | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(ar{d}_2\gamma^{\mu}T^Ad_3 ight)$             | $\mathbf{C}$    |
| qd8_3333  | $\left(ar{q}_3\gamma_{\mu}T^Aq_3 ight)\left(d_3\gamma^{\mu}T^Ad_3 ight)$                 | R               |
| ledq_1111 | $\left( ar{\ell}_1 e_1  ight) \left( ar{d}_1 q_1  ight)$                                 | $\mathbf{C}$    |
| ledq_1112 | $\left(ar{\ell}_1e_1 ight)\left(ar{d}_1q_2 ight)$  | $\mathbf{C}$    |
| ledq_1113 | $ig(ar{\ell}_1 e_1ig)ig(ar{d}_1 q_3ig)$  | $\mathbf{C}$    |
| ledq_1121 | $\left(ar{\ell}_1e_1 ight)\left(ar{d}_2q_1 ight)$  | $^{\mathrm{C}}$ |
| ledq_1122 | $\left(ar{\ell}_1 e_1 ight)\left(ar{d}_2 q_2 ight)$                                      | $\mathbf{C}$    |
| ledq_1123 | $\left(ar{\ell}_1 e_1 ight)\left(ar{d}_2 q_3 ight)$                                      | $\mathbf{C}$    |
| ledq_1131 | $\left(ar{\ell}_1 e_1 ight)\left(ar{d}_3 q_1 ight)$                                      | $^{\mathrm{C}}$ |
| ledq_1132 | $\left(ar{\ell}_1e_1 ight)\left(ar{d}_3q_2 ight)$  | $^{\mathrm{C}}$ |
| ledq_1133 | $\left(ar{\ell}_1e_1 ight)\left(ar{d}_3q_3 ight)$  | $^{\mathrm{C}}$ |
| ledq_1211 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_1q_1 ight)$  | $^{\mathrm{C}}$ |
| ledq_1212 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_1q_2 ight)$  | $^{\mathrm{C}}$ |
| ledq_1213 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_1q_3 ight)$  | $^{\mathrm{C}}$ |

| WC name   | Operator   | Type            |
|-----------|--|-----------------|
| ledq_1221 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_2q_1 ight)$                            | С               |
| ledq_1222 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_2q_2 ight)$                            | $\mathbf{C}$    |
| ledq_1223 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_2q_3 ight)$                            | $\mathbf{C}$    |
| ledq_1231 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_3q_1 ight)$                            | $\mathbf{C}$    |
| ledq_1232 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_3q_2 ight)$                            | $\mathbf{C}$    |
| ledq_1233 | $\left(ar{\ell}_1e_2 ight)\left(ar{d}_3q_3 ight)$                            | $\mathbf{C}$    |
| ledq_1311 | $ig(ar{\ell}_1e_3ig)ig(ar{d}_1q_1ig)$  | $\mathbf{C}$    |
| ledq_1312 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_1q_2 ight)$                            | $\mathbf{C}$    |
| ledq_1313 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_1q_3 ight)$                            | $\mathbf{C}$    |
| ledq_1321 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_2q_1 ight)$                            | $\mathbf{C}$    |
| ledq_1322 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_2q_2 ight)$                            | $\mathbf{C}$    |
| ledq_1323 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_2q_3 ight)$                            | $\mathbf{C}$    |
| ledq_1331 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_3q_1 ight)$                            | $\mathbf{C}$    |
| ledq_1332 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_3q_2 ight)$                            | $\mathbf{C}$    |
| ledq_1333 | $\left(ar{\ell}_1e_3 ight)\left(ar{d}_3q_3 ight)$                            | $\mathbf{C}$    |
| ledq_2111 | $\left(ar{\ell}_{2}e_{1} ight)\left(ar{d}_{1}q_{1} ight)$                    | $\mathbf{C}$    |
| ledq_2112 | $\left(ar{\ell}_2 e_1 ight)\left(ar{d}_1 q_2 ight)$                          | $\mathbf{C}$    |
| ledq_2113 | $\left(\ell_{2}e_{1} ight)\left(d_{1}q_{3} ight)$                            | $\mathbf{C}$    |
| ledq_2121 | $\left(ar{\ell}_2 e_1 ight)\left(ar{d}_2 q_1 ight)$                          | $\mathbf{C}$    |
| ledq_2122 | $\left(ar{\ell}_2 e_1 ight)\left(ar{d}_2 q_2 ight)$                          | $\mathbf{C}$    |
| ledq_2123 | $\left(\ell_{2}e_{1} ight)\left(d_{2}q_{3} ight)$                            | $\mathbf{C}$    |
| ledq_2131 | $\left(ar{\ell}_2 e_1 ight)\left(ar{d}_3 q_1 ight)$                          | $\mathbf{C}$    |
| ledq_2132 | $\left(ar{\ell}_2 e_1 ight)\left(ar{d}_3 q_2 ight)$                          | $\mathbf{C}$    |
| ledq_2133 | $\left(ar{\ell}_2 e_1 ight)\left(ar{d}_3 q_3 ight)$                          | $\mathbf{C}$    |
| ledq_2211 | $\left(ar{\ell}_2 e_2 ight)\left(ar{d}_1 q_1 ight)$                          | $\mathbf{C}$    |
| ledq_2212 | $\left(ar{\ell}_2 e_2 ight)\left(ar{d}_1 q_2 ight)$                          | $\mathbf{C}$    |
| ledq_2213 | $\left(ar{\ell}_2 e_2 ight)\left(ar{d}_1 q_3 ight)$                          | $\mathbf{C}$    |
| ledq_2221 | $\left(ar{\ell}_2 e_2 ight)\left(ar{d}_2 q_1 ight)$                          | $\mathbf{C}$    |
| ledq_2222 | $\left(ar{\ell}_2 e_2 ight)\left(ar{d}_2 q_2 ight)$                          | $\mathbf{C}$    |
| ledq_2223 | $\left(ar{\ell}_2 e_2 ight)\left(ar{d}_2 q_3 ight)$                          | $\mathbf{C}$    |
| ledq_2231 | $\left(\ell_{2}e_{2}\right)\left(d_{3}q_{1}\right)$                          | $\mathbf{C}$    |
| ledq_2232 | $\left(ar{\ell}_{2}e_{2} ight)\left(ar{d}_{3}q_{2} ight)$                    | $\mathbf{C}$    |
| ledq_2233 | $\left(ar{\ell}_2 e_2 ight)\left(ar{d}_3 q_3 ight)$                          | $\mathbf{C}$    |
| ledq_2311 | $\left(ar{\ell}_2 e_3 ight) \left(ar{d}_1 q_1 ight)$                         | $\mathbf{C}$    |
| ledq_2312 | $\left( \underline{\ell}_{2}e_{3} ight) \left( \underline{d}_{1}q_{2} ight)$ | С               |
| ledq_2313 | $\left(ar{\ell}_2 e_3 ight)\left(ar{d}_1 q_3 ight)$                          | $\mathbf{C}$    |
| ledq_2321 | $\left(ar{\ell}_2 e_3 ight)\left(ar{d}_2 q_1 ight)$                          | $\mathbf{C}$    |
| ledq_2322 | $\left(ar{\ell}_2 e_3 ight) \left(ar{d}_2 q_2 ight)$                         | $^{\mathrm{C}}$ |
| ledq_2323 | $\left(ar{\ell}_2 e_3 ight)\left(ar{d}_2 q_3 ight)$                          | $\mathbf{C}$    |
| ledq_2331 | $\left(ar{\ell}_{2}e_{3} ight)\left(ar{d}_{3}q_{1} ight)$                    | $\mathbf{C}$    |
| ledq_2332 | $\left(ar{\ell}_2 e_3 ight) \left(ar{d}_3 q_2 ight)$                         | $\mathbf{C}$    |
| ledq_2333 | $\left(ar{\ell}_2 e_3 ight)\left(ar{d}_3 q_3 ight)$                          | С               |

| WC name                  | Operator  | Type                          |
|--------------------------|---|-------------------------------|
| ledq_3111                | $\left(ar{\ell}_{3}e_{1} ight)\left(ar{d}_{1}q_{1} ight)$   | С                             |
| ledq_3112                | $\left(ar{\ell}_3 e_1 ight)\left(ar{d}_1 q_2 ight)$   | $\mathbf{C}$                  |
| ledq_3113                | $ig(ar{\ell}_3 e_1ig)ig(ar{d}_1 q_3ig)$   | $\mathbf{C}$                  |
| ledq_3121                | $ig(ar{\ell}_3 e_1ig)ig(ar{d}_2 q_1ig)$   | $\mathbf{C}$                  |
| ledq_3122                | $ig(ar{\ell}_3 e_1ig)ig(ar{d}_2 q_2ig)$   | $\mathbf{C}$                  |
| ledq_3123                | $ig(ar{\ell}_3 e_1ig)ig(ar{d}_2 q_3ig)$   | $\mathbf{C}$                  |
| ledq_3131                | $(ar{\ell}_3 e_1) (ar{d}_3 q_1)$  | $\mathbf{C}$                  |
| ledq_3132                | $ig(ar{\ell}_3 e_1ig)ig(ar{d}_3 q_2ig)$   | $\mathbf{C}$                  |
| ledq_3133                | $ig(ar{\ell}_3 e_1ig)ig(ar{d}_3 q_3ig)$   | $\mathbf{C}$                  |
| ledq_3211                | $(ar{\ell}_3 e_2) (ar{d}_1 q_1)$  | $\mathbf{C}$                  |
| ledq_3212                | $ig(ar{\ell}_3 e_2ig)ig(ar{d}_1 q_2ig)$   | $\mathbf{C}$                  |
| ledq_3213                | $ig(ar{\ell}_3 e_2ig)ig(ar{d}_1 q_3ig)$   | $\mathbf{C}$                  |
| ledq_3221                | $\left(ar{\ell}_3 e_2 ight)\left(ar{d}_2 q_1 ight)$   | $\mathbf{C}$                  |
| ledq_3222                | $ig(ar{\ell}_3 e_2ig)ig(ar{d}_2 q_2ig)$   | $\mathbf{C}$                  |
| ledq_3223                | $\left(ar{\ell}_3e_2 ight)\left(ar{d}_2q_3 ight)$   | $\mathbf{C}$                  |
| ledq_3231                | $\left(ar{\ell}_3e_2 ight)\left(ar{d}_3q_1 ight)$   | $\mathbf{C}$                  |
| ledq_3232                | $\left(ar{\ell}_3e_2 ight)\left(ar{d}_3q_2 ight)$   | $\mathbf{C}$                  |
| ledq_3233                | $\left(ar{\ell}_3e_2 ight)\left(ar{d}_3q_3 ight)$   | $\mathbf{C}$                  |
| ledq_3311                | $\left(ar{\ell}_3 e_3 ight)\left(ar{d}_1 q_1 ight)$   | $\mathbf{C}$                  |
| ledq_3312                | $\left(ar{\ell}_3e_3 ight)\left(ar{d}_1q_2 ight)$   | $\mathbf{C}$                  |
| ledq_3313                | $\left(ar{\ell}_3e_3 ight)\left(ar{d}_1q_3 ight)$   | $\mathbf{C}$                  |
| ledq_3321                | $\left(ar{\ell}_3e_3 ight)\left(ar{d}_2q_1 ight)$   | $\mathbf{C}$                  |
| ledq_3322                | $\left(ar{\ell}_3e_3 ight)\left(ar{d}_2q_2 ight)$   | $\mathbf{C}$                  |
| ledq_3323                | $\left(ar{\ell}_3 e_3 ight)\left(ar{d}_2 q_3 ight)$   | $\mathbf{C}$                  |
| ledq_3331                | $\left(ar{\ell}_3e_3 ight)\left(ar{d}_3q_1 ight)$   | $\mathbf{C}$                  |
| ledq_3332                | $\left(ar{\ell}_3e_3 ight)\left(ar{d}_3q_2 ight)$   | $\mathbf{C}$                  |
| ledq_3333                | $\left(ar{\ell}_3e_3 ight)\left(ar{d}_3q_3 ight)$   | $\mathbf{C}$                  |
| quqd1_1111               | $\left(ar{q}_{1}u_{1} ight)\epsilon_{jk}\left(ar{q}_{1}d_{1} ight)$   | $\mathbf{C}$                  |
| quqd1_1112               | $\left(ar{q}_{1}u_{1} ight)\epsilon_{jk}\left(ar{q}_{1}d_{2} ight)$   | $\mathbf{C}$                  |
| quqd1_1113               | $\left(ar{q}_{1}u_{1} ight)\epsilon_{jk}\left(ar{q}_{1}d_{3} ight)$   | C                             |
| quqd1_1121               | $(ar{q}_1u_1)\epsilon_{jk}(ar{q}_2d_1)$   | C                             |
| quqd1_1122               | $(ar{q}_1u_1)\epsilon_{jk}(ar{q}_2d_2)$   | С                             |
| quqd1_1123               | $(\bar{q}_1u_1)\epsilon_{jk}(\bar{q}_2d_3)$   | С                             |
| quqd1_1131               | $(\bar{q}_1 u_1) \epsilon_{jk} (\bar{q}_3 d_1)$   | С                             |
| quqd1_1132               | $(\bar{q}_1u_1)\epsilon_{jk}(\bar{q}_3d_2)$   | $_{ m C}^{ m C}$              |
| quqd1_1133               | $(ar{q}_1u_1)\epsilon_{jk}(ar{q}_3d_3)$   | C                             |
| quqd1_1211<br>quqd1_1212 | $egin{aligned} \left(ar{q}_1u_2 ight)\epsilon_{jk}\left(ar{q}_1d_1 ight) \ \left(ar{q}_1u_2 ight)\epsilon_{jk}\left(ar{q}_1d_2 ight) \end{aligned}$ | C                             |
| quqd1_1212<br>quqd1_1213 | $egin{array}{l} (q_1u_2)\epsilon_{jk}(q_1u_2)\ (ar q_1u_2)\epsilon_{jk}(ar q_1d_3) \end{array}$   | C                             |
| quqd1_1213<br>quqd1_1221 | $egin{array}{l} (q_1u_2)\epsilon_{jk}(q_1u_3)\ (ar q_1u_2)\epsilon_{jk}(ar q_2d_1) \end{array}$   | C                             |
| quqd1_1222               | $egin{array}{l} (q_1u_2)\epsilon_{jk}(q_2u_1) \ (ar{q}_1u_2)\epsilon_{jk}(ar{q}_2d_2) \end{array}$  | C                             |
| quqd1_1223               | $egin{array}{l} (q_1 a_2) \epsilon_{jk} (q_2 a_2) \ (ar q_1 a_2) \epsilon_{jk} (ar q_2 d_3) \end{array}$  | $\stackrel{	ext{C}}{	ext{C}}$ |
| quqd1_1231               | $(q_1u_2)\epsilon_{jk}(q_2u_3) \ (ar q_1u_2)\epsilon_{jk}(ar q_3d_1)$   | $\overset{\circ}{\mathrm{C}}$ |
| 1-1                      | (11 ·· 2) *Jh (10 ·· 1)   | ~                             |

| WC name    | Operator  | Type            |
|------------|---|-----------------|
| quqd1_1232 | $(\bar{q}_1 u_2)  \epsilon_{jk}  (\bar{q}_3 d_2)$                         | C               |
| quqd1_1233 | $(ar{q}_1u_2)\epsilon_{jk}(ar{q}_3d_3)$                                   | $^{\mathrm{C}}$ |
| quqd1_1311 | $\left(ar{q}_{1}u_{3} ight)\epsilon_{jk}\left(ar{q}_{1}d_{1} ight)$       | $^{\mathrm{C}}$ |
| quqd1_1312 | $\left(ar{q}_1 u_3 ight) \epsilon_{jk} \left(ar{q}_1 d_2 ight)$           | $\mathbf{C}$    |
| quqd1_1313 | $\left(ar{q}_{1}u_{3} ight)\epsilon_{jk}\left(ar{q}_{1}d_{3} ight)$       | $^{\mathrm{C}}$ |
| quqd1_1321 | $\left(ar{q}_{1}u_{3} ight)\epsilon_{jk}\left(ar{q}_{2}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_1322 | $\left(ar{q}_1 u_3 ight) \epsilon_{jk} \left(ar{q}_2 d_2 ight)$           | $\mathbf{C}$    |
| quqd1_1323 | $\left(ar{q}_{1}u_{3} ight)\epsilon_{jk}\left(ar{q}_{2}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_1331 | $\left(ar{q}_{1}u_{3} ight)\epsilon_{jk}\left(ar{q}_{3}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_1332 | $\left(ar{q}_{1}u_{3} ight)\epsilon_{jk}\left(ar{q}_{3}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_1333 | $\left(ar{q}_{1}u_{3} ight)\epsilon_{jk}\left(ar{q}_{3}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2111 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{1}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2112 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{1}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2113 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{1}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2121 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{2}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2122 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{2}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2123 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{2}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2131 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{3}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2132 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{3}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2133 | $\left(ar{q}_{2}u_{1} ight)\epsilon_{jk}\left(ar{q}_{3}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2211 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{1}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2212 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{1}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2213 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{1}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2221 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{2}d_{1} ight)$       | $^{\mathrm{C}}$ |
| quqd1_2222 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{2}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2223 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{2}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2231 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{3}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2232 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{3}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2233 | $\left(ar{q}_{2}u_{2} ight)\epsilon_{jk}\left(ar{q}_{3}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2311 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{1}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2312 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{1}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2313 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{1}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2321 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{2}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2322 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{2}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2323 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{2}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_2331 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{3}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_2332 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{3}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_2333 | $\left(ar{q}_{2}u_{3} ight)\epsilon_{jk}\left(ar{q}_{3}d_{3} ight)$       | $\mathbf{C}$    |
| quqd1_3111 | $\left(ar{q}_{3}u_{1} ight)\epsilon_{jk}\left(ar{q}_{1}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_3112 | $\left( ar{q}_{3}u_{1} ight) \epsilon_{jk}\left( ar{q}_{1}d_{2} ight)$    | $\mathbf{C}$    |
| quqd1_3113 | $(\bar{q}_3u_1)\epsilon_{jk}(\bar{q}_1d_3)$                               | $\mathbf{C}$    |
| quqd1_3121 | $\left(ar{q}_{3}u_{1} ight)\epsilon_{jk}\left(ar{q}_{2}d_{1} ight)$       | $\mathbf{C}$    |
| quqd1_3122 | $\left(ar{q}_{3}u_{1} ight)\epsilon_{jk}\left(ar{q}_{2}d_{2} ight)$       | $\mathbf{C}$    |
| quqd1_3123 | $\left(\bar{q}_{3}u_{1}\right)\epsilon_{jk}\left(\bar{q}_{2}d_{3}\right)$ | $\mathbf{C}$    |
|            |   |                 |

| WC name    | Operator   | Type            |
|------------|--|-----------------|
| quqd1_3131 | $\left(\bar{q}_{3}u_{1}\right)\epsilon_{jk}\left(\bar{q}_{3}d_{1}\right)$                                      | C               |
| quqd1_3132 | $(\bar{q}_3 u_1)  \epsilon_{jk}  (\bar{q}_3 d_2)$  | $^{\mathrm{C}}$ |
| quqd1_3133 | $\left(ar{q}_3u_1 ight)\epsilon_{jk}\left(ar{q}_3d_3 ight)$  | $^{\mathrm{C}}$ |
| quqd1_3211 | $(\bar{q}_3 u_2)  \epsilon_{jk}  (\bar{q}_1 d_1)$  | $^{\mathrm{C}}$ |
| quqd1_3212 | $\left(\bar{q}_{3}u_{2}\right)\epsilon_{jk}\left(\bar{q}_{1}d_{2}\right)$                                      | $^{\mathrm{C}}$ |
| quqd1_3213 | $\left(\bar{q}_{3}u_{2}\right)\epsilon_{jk}\left(\bar{q}_{1}d_{3}\right)$                                      | $^{\mathrm{C}}$ |
| quqd1_3221 | $(\bar{q}_3 u_2)  \epsilon_{jk}  (\bar{q}_2 d_1)$  | $^{\mathrm{C}}$ |
| quqd1_3222 | $(\bar{q}_3 u_2)  \epsilon_{jk}  (\bar{q}_2 d_2)$  | $^{\mathrm{C}}$ |
| quqd1_3223 | $(\bar{q}_3 u_2)  \epsilon_{jk}  (\bar{q}_2 d_3)$  | $^{\mathrm{C}}$ |
| quqd1_3231 | $(\bar{q}_3 u_2)  \epsilon_{jk}  (\bar{q}_3 d_1)$  | $^{\mathrm{C}}$ |
| quqd1_3232 | $(\bar{q}_3 u_2)  \epsilon_{jk}  (\bar{q}_3 d_2)$  | $^{\mathrm{C}}$ |
| quqd1_3233 | $(\bar{q}_3 u_2)  \epsilon_{jk}  (\bar{q}_3 d_3)$  | $^{\mathrm{C}}$ |
| quqd1_3311 | $(\bar{q}_3u_3)\epsilon_{jk}(\bar{q}_1d_1)$  | $^{\mathrm{C}}$ |
| quqd1_3312 | $(\bar{q}_3 u_3)  \epsilon_{jk}  (\bar{q}_1 d_2)$  | $^{\mathrm{C}}$ |
| quqd1_3313 | $(\bar{q}_3u_3)\epsilon_{jk}(\bar{q}_1d_3)$  | $^{\mathrm{C}}$ |
| quqd1_3321 | $(ar{q}_3u_3)\epsilon_{jk}(ar{q}_2d_1)$  | $\mathbf{C}$    |
| quqd1_3322 | $(ar{q}_3u_3)\epsilon_{jk}(ar{q}_2d_2)$  | $\mathbf{C}$    |
| quqd1_3323 | $(ar{q}_3u_3)\epsilon_{jk}(ar{q}_2d_3)$  | $\mathbf{C}$    |
| quqd1_3331 | $(ar{q}_3u_3)\epsilon_{jk}(ar{q}_3d_1)$  | $\mathbf{C}$    |
| quqd1_3332 | $(ar{q}_3u_3)\epsilon_{jk}(ar{q}_3d_2)$  | $\mathbf{C}$    |
| quqd1_3333 | $(ar{q}_3u_3)\epsilon_{jk}(ar{q}_3d_3)$  | $\mathbf{C}$    |
| quqd8_1111 | $(\bar{q}_1 T^A u_1) \epsilon_{jk} (\bar{q}_1 T^A d_1)$  | $\mathbf{C}$    |
| quqd8_1112 | $\left\langle ar{q}_1 T^A u_1 \right angle \epsilon_{jk} \left\langle ar{q}_1 T^A d_2 \right angle$            | $\mathbf{C}$    |
| quqd8_1113 | $\left\langle ar{q}_1 T^A u_1 \right angle \epsilon_{jk} \left\langle ar{q}_1 T^A d_3 \right angle$            | $\mathbf{C}$    |
| quqd8_1121 | $\left(\bar{q}_1 T^A u_1\right) \epsilon_{ik} \left(\bar{q}_2 T^A d_1\right)$                                  | $\mathbf{C}$    |
| quqd8_1122 | $(\bar{q}_1 T^A u_1) \epsilon_{jk} (\bar{q}_2 T^A d_2)$  | $\mathbf{C}$    |
| quqd8_1123 | $\left\langle ar{q}_1 T^A u_1 \right angle \epsilon_{jk} \left\langle ar{q}_2 T^A d_3 \right angle$            | $\mathbf{C}$    |
| quqd8_1131 | $\left(\bar{q}_1 T^A u_1\right) \epsilon_{ik} \left(\bar{q}_3 T^A d_1\right)$                                  | $\mathbf{C}$    |
| quqd8_1132 | $\left(\bar{q}_1 T^A u_1\right) \epsilon_{jk} \left(\bar{q}_3 T^A d_2\right)$                                  | $\mathbf{C}$    |
| quqd8_1133 | $\left(ar{q}_1 T^A u_1 ight) \epsilon_{jk} \left(ar{q}_3 T^A d_3 ight)$  | $\mathbf{C}$    |
| quqd8_1211 | $\left(ar{q}_1 T^A u_2\right) \epsilon_{jk} \left(ar{q}_1 T^A d_1\right)$                                      | $\mathbf{C}$    |
| quqd8_1212 | $\left(ar{q}_1 T^A u_2\right) \epsilon_{jk} \left(ar{q}_1 T^A d_2\right)$                                      | $\mathbf{C}$    |
| quqd8_1213 | $\left\langle ar{q}_1 T^A u_2 \right angle \epsilon_{jk} \left\langle ar{q}_1 T^A d_3 \right angle$            | $\mathbf{C}$    |
| quqd8_1221 | $\left(\bar{q}_1 T^A u_2\right) \epsilon_{jk} \left(\bar{q}_2 T^A d_1\right)$                                  | $\mathbf{C}$    |
| quqd8_1222 | $(\bar{q}_1 T^A u_2) \epsilon_{ik} (\bar{q}_2 T^A d_2)$  | $\mathbf{C}$    |
| quqd8_1223 | $\left\langle \bar{q}_{1}T^{A}u_{2}\right\rangle \epsilon_{jk}\left\langle \bar{q}_{2}T^{A}d_{3}\right\rangle$ | $\mathbf{C}$    |
| quqd8_1231 | $\left\langle ar{q}_{1}T^{A}u_{2} ight angle \epsilon_{jk}\left\langle ar{q}_{3}T^{A}d_{1} ight angle$         | $\mathbf{C}$    |
| quqd8_1232 | $\left\langle ar{q}_1 T^A u_2 \right angle \epsilon_{jk} \left\langle ar{q}_3 T^A d_2 \right angle$            | $\mathbf{C}$    |
| quqd8_1233 | $\left\langle \bar{q}_{1}T^{A}u_{2} ight angle \epsilon_{jk}\left\langle \bar{q}_{3}T^{A}d_{3} ight angle$     | $\mathbf{C}$    |
| quqd8_1311 | $\langle \bar{q}_1 T^A u_3 \rangle \epsilon_{jk} \langle \bar{q}_1 T^A d_1 \rangle$                            | $\mathbf{C}$    |
| quqd8_1312 | $\left\langle ar{q}_1 T^A u_3 \right angle \epsilon_{jk} \left\langle ar{q}_1 T^A d_2 \right angle$            | $^{\mathrm{C}}$ |
| quqd8_1313 | $\left\langle ar{q}_1 T^A u_3 \right angle \epsilon_{jk} \left\langle ar{q}_1 T^A d_3 \right angle$            | $^{\mathrm{C}}$ |
| quqd8_1321 | $\left\langle ar{q}_1 T^A u_3 \right angle \epsilon_{jk} \left\langle ar{q}_2 T^A d_1 \right angle$            | $^{\mathrm{C}}$ |
| quqd8_1322 | $\left\langle ar{q}_1 T^A u_3 \right angle \epsilon_{jk} \left\langle ar{q}_2 T^A d_2 \right angle$            | C               |
|            | ( -  |                 |

| WC name    | Operator   | Type            |
|------------|--|-----------------|
| quqd8_1323 | $(\bar{q}_1 T^A u_3) \epsilon_{jk} (\bar{q}_2 T^A d_3)$  | C               |
| quqd8_1331 | $\left\langle ar{q}_1 T^A u_3 \right angle \epsilon_{jk} \left\langle ar{q}_3 T^A d_1 \right angle$            | $^{\mathrm{C}}$ |
| quqd8_1332 | $(\bar{q}_1 T^A u_3) \epsilon_{jk} (\bar{q}_3 T^A d_2)$  | $^{\mathrm{C}}$ |
| quqd8_1333 | $(\bar{q}_1 T^A u_3) \epsilon_{jk} (\bar{q}_3 T^A d_3)$  | $\mathbf{C}$    |
| quqd8_2111 | $(\bar{q}_2 T^A u_1) \epsilon_{ik} (\bar{q}_1 T^A d_1)$  | $\mathbf{C}$    |
| quqd8_2112 | $\left\langle \bar{q}_2 T^A u_1 \right\rangle \epsilon_{jk} \left\langle \bar{q}_1 T^A d_2 \right\rangle$      | $\mathbf{C}$    |
| quqd8_2113 | $(\bar{q}_2 T^A u_1) \epsilon_{jk} (\bar{q}_1 T^A d_3)$  | $\mathbf{C}$    |
| quqd8_2121 | $\left\langle ar{q}_2 T^A u_1 \right angle \epsilon_{jk} \left\langle ar{q}_2 T^A d_1  ight angle$             | $\mathbf{C}$    |
| quqd8_2122 | $\left\langle ar{q}_{2}T^{A}u_{1} ight angle \epsilon_{jk}\left\langle ar{q}_{2}T^{A}d_{2} ight angle$         | $\mathbf{C}$    |
| quqd8_2123 | $\left\langle ar{q}_{2}T^{A}u_{1} ight angle \epsilon_{jk}\left\langle ar{q}_{2}T^{A}d_{3} ight angle$         | $\mathbf{C}$    |
| quqd8_2131 | $\left\langle ar{q}_{2}T^{A}u_{1} ight angle \epsilon_{jk}\left\langle ar{q}_{3}T^{A}d_{1} ight angle$         | $\mathbf{C}$    |
| quqd8_2132 | $\left\langle ar{q}_{2}T^{A}u_{1} ight angle \epsilon_{jk}\left\langle ar{q}_{3}T^{A}d_{2} ight angle$         | $\mathbf{C}$    |
| quqd8_2133 | $\left(ar{q}_2 T^A u_1\right) \epsilon_{jk} \left(ar{q}_3 T^A d_3\right)$                                      | $\mathbf{C}$    |
| quqd8_2211 | $\left(ar{q}_2 T^A u_2\right) \epsilon_{jk} \left(ar{q}_1 T^A d_1\right)$                                      | $\mathbf{C}$    |
| quqd8_2212 | $\left\langle ar{q}_{2}T^{A}u_{2} ight angle \epsilon_{jk}\left\langle ar{q}_{1}T^{A}d_{2} ight angle$         | $\mathbf{C}$    |
| quqd8_2213 | $\left( ar{q}_2 T^A u_2 \right) \epsilon_{jk} \left( ar{q}_1 T^A d_3 \right)$                                  | $\mathbf{C}$    |
| quqd8_2221 | $\left( ar{q}_2 T^A u_2 \right) \epsilon_{jk} \left( ar{q}_2 T^A d_1 \right)$                                  | $\mathbf{C}$    |
| quqd8_2222 | $\left(ar{q}_2 T^A u_2\right) \epsilon_{jk} \left(ar{q}_2 T^A d_2\right)$                                      | $\mathbf{C}$    |
| quqd8_2223 | $\left( ar{q}_2 T^A u_2 \right) \epsilon_{jk} \left( ar{q}_2 T^A d_3 \right)$                                  | $\mathbf{C}$    |
| quqd8_2231 | $\left(ar{q}_2 T^A u_2\right) \epsilon_{jk} \left(ar{q}_3 T^A d_1\right)$                                      | $\mathbf{C}$    |
| quqd8_2232 | $\left(\bar{q}_2 T^A u_2\right) \epsilon_{jk} \left(\bar{q}_3 T^A d_2\right)$                                  | $\mathbf{C}$    |
| quqd8_2233 | $\left(\bar{q}_2 T^A u_2\right) \epsilon_{jk} \left(\bar{q}_3 T^A d_3\right)$                                  | $\mathbf{C}$    |
| quqd8_2311 | $\left( ar{q}_2 T^A u_3 \right) \epsilon_{jk} \left( ar{q}_1 T^A d_1 \right)$                                  | $\mathbf{C}$    |
| quqd8_2312 | $\left( ar{q}_2 T^A u_3 \right) \epsilon_{jk} \left( ar{q}_1 T^A d_2 \right)$                                  | $\mathbf{C}$    |
| quqd8_2313 | $\left( ar{q}_2 T^A u_3 \right) \epsilon_{jk} \left( ar{q}_1 T^A d_3 \right)$                                  | $\mathbf{C}$    |
| quqd8_2321 | $\left(ar{q}_2 T^A u_3\right) \epsilon_{jk} \left(ar{q}_2 T^A d_1\right)$                                      | $\mathbf{C}$    |
| quqd8_2322 | $\left(ar{q}_2 T^A u_3\right) \epsilon_{jk} \left(ar{q}_2 T^A d_2\right)$                                      | $\mathbf{C}$    |
| quqd8_2323 | $\left(\bar{q}_2 T^A u_3\right) \epsilon_{jk} \left(\bar{q}_2 T^A d_3\right)$                                  | $\mathbf{C}$    |
| quqd8_2331 | $\left( ar{q}_2 T^A u_3 \right) \epsilon_{jk} \left( ar{q}_3 T^A d_1 \right)$                                  | $\mathbf{C}$    |
| quqd8_2332 | $\left( ar{q}_2 T^A u_3 \right) \epsilon_{jk} \left( ar{q}_3 T^A d_2 \right)$                                  | $^{\mathrm{C}}$ |
| quqd8_2333 | $\left( ar{q}_2 T^A u_3 \right) \epsilon_{jk} \left( ar{q}_3 T^A d_3 \right)$                                  | $^{\mathrm{C}}$ |
| quqd8_3111 | $\left( ar{q}_{3}T^{A}u_{1} ight) \epsilon_{jk}\left( ar{q}_{1}T^{A}d_{1} ight)$                               | $^{\mathrm{C}}$ |
| quqd8_3112 | $\left( ar{q}_{3}T^{A}u_{1} ight) \epsilon_{jk}\left( ar{q}_{1}T^{A}d_{2} ight)$                               | $^{\mathrm{C}}$ |
| quqd8_3113 | $\left(ar{q}_3 T^A u_1\right) \epsilon_{jk} \left(ar{q}_1 T^A d_3\right)$                                      | $^{\mathrm{C}}$ |
| quqd8_3121 | $\left(\bar{q}_3 T^A u_1\right) \epsilon_{jk} \left(\bar{q}_2 T^A d_1\right)$                                  | C               |
| quqd8_3122 | $\left(\bar{q}_3 T^A u_1\right) \epsilon_{jk} \left(\bar{q}_2 T^A d_2\right)$                                  | C               |
| quqd8_3123 | $\left(ar{q}_3 T^A_{} u_1\right) \epsilon_{jk} \left(ar{q}_2 T^A_{} d_3\right)$                                | C               |
| quqd8_3131 | $\left\langle \bar{q}_{3}T^{A}u_{1}\right\rangle \epsilon_{jk}\left\langle \bar{q}_{3}T^{A}d_{1}\right\rangle$ | C               |
| quqd8_3132 | $\left(\bar{q}_{3}T^{A}u_{1}\right)\epsilon_{jk}\left(\bar{q}_{3}T^{A}d_{2}\right)$                            | C               |
| quqd8_3133 | $\left\langle ar{q}_3 T^A u_1 \right\rangle \epsilon_{jk} \left\langle ar{q}_3 T^A d_3 \right\rangle$          | C               |
| quqd8_3211 | $\left(\bar{q}_{3}T^{A}u_{2}\right)\epsilon_{jk}\left(\bar{q}_{1}T^{A}d_{1}\right)$                            | C               |
| quqd8_3212 | $\left( ar{q}_3 T^A u_2 \right) \epsilon_{jk} \left( ar{q}_1 T^A d_2 \right)$                                  | C               |
| quqd8_3213 | $\left(\bar{q}_3 T^A u_2\right) \epsilon_{jk} \left(\bar{q}_1 T^A d_3\right)$                                  | C               |
| quqd8_3221 | $\left(ar{q}_3 T^A u_2\right) \epsilon_{jk} \left(ar{q}_2 T^A d_1\right)$                                      | $^{\mathrm{C}}$ |

| WC name    | Operator  | Type            |
|------------|---|-----------------|
| quqd8_3222 | $(\bar{q}_3 T^A u_2)  \epsilon_{jk}  (\bar{q}_2 T^A d_2)$   | C               |
| quqd8_3223 | $\left\langle ar{q}_3 T^A u_2 \right angle \epsilon_{jk} \left\langle ar{q}_2 T^A d_3 \right angle$           | C               |
| quqd8_3231 | $\left\langle ar{q}_3 T^A u_2 \right\rangle \epsilon_{jk} \left\langle ar{q}_3 T^A d_1 \right\rangle$         | $^{\mathrm{C}}$ |
| quqd8_3232 | $\left(\bar{q}_3T^Au_2\right)\epsilon_{jk}\left(\bar{q}_3T^Ad_2\right)$                                       | $^{\mathrm{C}}$ |
| quqd8_3233 | $\left(\bar{q}_3T^Au_2\right)\epsilon_{jk}\left(\bar{q}_3T^Ad_3\right)$                                       | $^{\mathrm{C}}$ |
| quqd8_3311 | $\left(\bar{q}_3 T^A u_3\right) \epsilon_{jk} \left(\bar{q}_1 T^A d_1\right)$                                 | $^{\mathrm{C}}$ |
| quqd8_3312 | $(\bar{q}_3 T^A u_3) \epsilon_{jk} (\bar{q}_1 T^A d_2)$   | $\mathbf{C}$    |
| quqd8_3313 | $\langle \bar{q}_3 T^A u_3 \rangle \epsilon_{jk} \langle \bar{q}_1 T^A d_3 \rangle$                           | $\mathbf{C}$    |
| quqd8_3321 | $\left\langle ar{q}_{3}T^{A}u_{3} ight angle \epsilon_{jk}\left\langle ar{q}_{2}T^{A}d_{1} ight angle$        | $\mathbf{C}$    |
| quqd8_3322 | $\left\langle ar{q}_{3}T^{A}u_{3} ight angle \epsilon_{jk}\left\langle ar{q}_{2}T^{A}d_{2} ight angle$        | $\mathbf{C}$    |
| quqd8_3323 | $\left\langle \bar{q}_{3}T^{A}u_{3}\right angle \epsilon_{jk}\left\langle \bar{q}_{2}T^{A}d_{3}\right\rangle$ | $\mathbf{C}$    |
| quqd8_3331 | $\left(\bar{q}_3 T^A u_3\right) \epsilon_{jk} \left(\bar{q}_3 T^A d_1\right)$                                 | $^{\mathrm{C}}$ |
| quqd8_3332 | $\left(\bar{q}_3 T^A u_3\right) \epsilon_{jk} \left(\bar{q}_3 T^A d_2\right)$                                 | $^{\mathrm{C}}$ |
| quqd8_3333 | $\left( ar{q}_3 T^A u_3 \right) \epsilon_{jk} \left( ar{q}_3 T^A d_3 \right)$                                 | С               |
| lequ1_1111 | $\left(ar{\ell}_1 e_1 ight)\epsilon_{jk}\left(ar{q}_1 u_1 ight)$  | $^{\mathrm{C}}$ |
| lequ1_1112 | $(\bar{\ell}_1 e_1) \epsilon_{jk} (\bar{q}_1 u_2)$  | $\mathbf{C}$    |
| lequ1_1113 | $(\bar{\ell}_1 e_1) \epsilon_{jk} (\bar{q}_1 u_3)$  | $^{\mathrm{C}}$ |
| lequ1_1121 | $(\bar{\ell}_1 e_1) \epsilon_{jk} (\bar{q}_2 u_1)$  | $\mathbf{C}$    |
| lequ1_1122 | $(\bar{\ell}_1 e_1) \epsilon_{jk} (\bar{q}_2 u_2)$  | $\mathbf{C}$    |
| lequ1_1123 | $(ar{\ell}_1 e_1)  \epsilon_{jk}  (ar{q}_2 u_3)$  | $\mathbf{C}$    |
| lequ1_1131 | $\left(ar{\ell}_{1}e_{1} ight)\epsilon_{jk}\left(ar{q}_{3}u_{1} ight)$  | $\mathbf{C}$    |
| lequ1_1132 | $\left(ar{\ell}_{1}e_{1} ight)\epsilon_{jk}\left(ar{q}_{3}u_{2} ight)$  | $\mathbf{C}$    |
| lequ1_1133 | $(\bar{\ell}_1 e_1) \epsilon_{jk} (\bar{q}_3 u_3)$  | $\mathbf{C}$    |
| lequ1_1211 | $(ar{\ell}_1 e_2)  \epsilon_{jk}  (ar{q}_1 u_1)$  | $\mathbf{C}$    |
| lequ1_1212 | $(\bar{\ell}_1 e_2) \epsilon_{jk} (\bar{q}_1 u_2)$  | $\mathbf{C}$    |
| lequ1_1213 | $\left(ar{\ell}_{1}e_{2} ight)\epsilon_{jk}\left(ar{q}_{1}u_{3} ight)$  | $\mathbf{C}$    |
| lequ1_1221 | $(\bar{\ell}_1 e_2) \epsilon_{jk} (\bar{q}_2 u_1)$  | $\mathbf{C}$    |
| lequ1_1222 | $(ar{\ell}_1 e_2)  \epsilon_{jk}  (ar{q}_2 u_2)$  | $\mathbf{C}$    |
| lequ1_1223 | $(ar{\ell}_1 e_2)  \epsilon_{jk}  (ar{q}_2 u_3)$  | $\mathbf{C}$    |
| lequ1_1231 | $(ar{\ell}_1 e_2) \epsilon_{jk} (ar{q}_3 u_1)$  | $\mathbf{C}$    |
| lequ1_1232 | $(ar{\ell}_1 e_2)  \epsilon_{jk}  (ar{q}_3 u_2)$  | $\mathbf{C}$    |
| lequ1_1233 | $(ar{\ell}_1 e_2)  \epsilon_{jk}  (ar{q}_3 u_3)$  | $\mathbf{C}$    |
| lequ1_1311 | $(ar{\ell}_1 e_3)  \epsilon_{jk}  (ar{q}_1 u_1)$  | $\mathbf{C}$    |
| lequ1_1312 | $(ar{\ell}_1 e_3)  \epsilon_{jk}  (ar{q}_1 u_2)$  | $\mathbf{C}$    |
| lequ1_1313 | $\left(ar{\ell}_1e_3 ight)\epsilon_{jk}\left(ar{q}_1u_3 ight)$  | $\mathbf{C}$    |
| lequ1_1321 | $(ar{\ell}_1 e_3)  \epsilon_{jk}  (ar{q}_2 u_1)$  | $^{\mathrm{C}}$ |
| lequ1_1322 | $(ar{\ell}_1 e_3)  \epsilon_{jk}  (ar{q}_2 u_2)$  | $^{\mathrm{C}}$ |
| lequ1_1323 | $(ar{\ell}_1 e_3)  \epsilon_{jk}  (ar{q}_2 u_3)$  | $^{\mathrm{C}}$ |
| lequ1_1331 | $(ar{\ell}_1e_3)\epsilon_{jk}(ar{q}_3u_1)$  | $^{\mathrm{C}}$ |
| lequ1_1332 | $(ar{\ell}_1 e_3)  \epsilon_{jk}  (ar{q}_3 u_2)$  | $^{\mathrm{C}}$ |
| lequ1_1333 | $(ar{\ell}_1 e_3) \epsilon_{jk} (ar{q}_3 u_3)$  | $^{\mathrm{C}}$ |
| lequ1_2111 | $(ar{\ell}_2 e_1)  \epsilon_{jk}  (ar{q}_1 u_1)$  | $^{\mathrm{C}}$ |
| lequ1_2112 | $(ar{\ell}_2 e_1) \epsilon_{jk} (ar{q}_1 u_2)$  | $^{\mathrm{C}}$ |
|            | \ -/ J ·· \ +/  |                 |

| WC name    | Operator   | Type         |
|------------|--|--------------|
| lequ1_2113 | $\left(ar{\ell}_{2}e_{1} ight)\epsilon_{jk}\left(ar{q}_{1}u_{3} ight)$ | С            |
| lequ1_2121 | $\left(ar{\ell}_{2}e_{1} ight)\epsilon_{jk}\left(ar{q}_{2}u_{1} ight)$ | $\mathbf{C}$ |
| lequ1_2122 | $\left(ar{\ell}_2 e_1 ight)\epsilon_{jk}\left(ar{q}_2 u_2 ight)$       | $\mathbf{C}$ |
| lequ1_2123 | $\left(ar{\ell}_{2}e_{1} ight)\epsilon_{jk}\left(ar{q}_{2}u_{3} ight)$ | $\mathbf{C}$ |
| lequ1_2131 | $(\bar{\ell}_2 e_1)  \epsilon_{jk}  (\bar{q}_3 u_1)$                   | $\mathbf{C}$ |
| lequ1_2132 | $(ar{\ell}_2 e_1)  \epsilon_{jk}  (ar{q}_3 u_2)$                       | $\mathbf{C}$ |
| lequ1_2133 | $\left(ar{\ell}_2 e_1 ight)\epsilon_{jk}\left(ar{q}_3 u_3 ight)$       | $\mathbf{C}$ |
| lequ1_2211 | $\left(ar{\ell}_2 e_2 ight)\epsilon_{jk}\left(ar{q}_1 u_1 ight)$       | $\mathbf{C}$ |
| lequ1_2212 | $\left(ar{\ell}_{2}e_{2} ight)\epsilon_{jk}\left(ar{q}_{1}u_{2} ight)$ | $\mathbf{C}$ |
| lequ1_2213 | $\left(ar{\ell}_{2}e_{2} ight)\epsilon_{jk}\left(ar{q}_{1}u_{3} ight)$ | $\mathbf{C}$ |
| lequ1_2221 | $\left(ar{\ell}_2 e_2 ight)\epsilon_{jk}\left(ar{q}_2 u_1 ight)$       | $\mathbf{C}$ |
| lequ1_2222 | $\left(ar{\ell}_{2}e_{2} ight)\epsilon_{jk}\left(ar{q}_{2}u_{2} ight)$ | $\mathbf{C}$ |
| lequ1_2223 | $\left(ar{\ell}_2 e_2 ight)\epsilon_{jk}\left(ar{q}_2 u_3 ight)$       | $\mathbf{C}$ |
| lequ1_2231 | $\left(ar{\ell}_2 e_2 ight)\epsilon_{jk}\left(ar{q}_3 u_1 ight)$       | $\mathbf{C}$ |
| lequ1_2232 | $\left(ar{\ell}_2 e_2 ight)\epsilon_{jk}\left(ar{q}_3 u_2 ight)$       | $\mathbf{C}$ |
| lequ1_2233 | $\left(ar{\ell}_{2}e_{2} ight)\epsilon_{jk}\left(ar{q}_{3}u_{3} ight)$ | $\mathbf{C}$ |
| lequ1_2311 | $\left(ar{\ell}_2 e_3 ight)\epsilon_{jk}\left(ar{q}_1 u_1 ight)$       | $\mathbf{C}$ |
| lequ1_2312 | $\left(ar{\ell}_2 e_3 ight)\epsilon_{jk}\left(ar{q}_1 u_2 ight)$       | $\mathbf{C}$ |
| lequ1_2313 | $\left(ar{\ell}_{2}e_{3} ight)\epsilon_{jk}\left(ar{q}_{1}u_{3} ight)$ | $\mathbf{C}$ |
| lequ1_2321 | $\left(ar{\ell}_{2}e_{3} ight)\epsilon_{jk}\left(ar{q}_{2}u_{1} ight)$ | $\mathbf{C}$ |
| lequ1_2322 | $\left(ar{\ell}_{2}e_{3} ight)\epsilon_{jk}\left(ar{q}_{2}u_{2} ight)$ | $\mathbf{C}$ |
| lequ1_2323 | $\left(ar{\ell}_2 e_3 ight)\epsilon_{jk}\left(ar{q}_2 u_3 ight)$       | $\mathbf{C}$ |
| lequ1_2331 | $\left(ar{\ell}_2 e_3\right) \epsilon_{jk} \left(ar{q}_3 u_1 ight)$    | $\mathbf{C}$ |
| lequ1_2332 | $\left(ar{\ell}_{2}e_{3} ight)\epsilon_{jk}\left(ar{q}_{3}u_{2} ight)$ | $\mathbf{C}$ |
| lequ1_2333 | $\left(ar{\ell}_{2}e_{3} ight)\epsilon_{jk}\left(ar{q}_{3}u_{3} ight)$ | $\mathbf{C}$ |
| lequ1_3111 | $\left(ar{\ell}_3 e_1 ight)\epsilon_{jk}\left(ar{q}_1 u_1 ight)$       | $\mathbf{C}$ |
| lequ1_3112 | $\left(ar{\ell}_3 e_1 ight)\epsilon_{jk}\left(ar{q}_1 u_2 ight)$       | $\mathbf{C}$ |
| lequ1_3113 | $\left(ar{\ell}_3 e_1 ight)\epsilon_{jk}\left(ar{q}_1 u_3 ight)$       | $\mathbf{C}$ |
| lequ1_3121 | $(ar{\ell}_3 e_1)  \epsilon_{jk}  (ar{q}_2 u_1)$                       | $\mathbf{C}$ |
| lequ1_3122 | $\left(ar{\ell}_3 e_1 ight)\epsilon_{jk}\left(ar{q}_2 u_2 ight)$       | $\mathbf{C}$ |
| lequ1_3123 | $\left(ar{\ell}_3 e_1\right) \epsilon_{jk} \left(ar{q}_2 u_3 ight)$    | $\mathbf{C}$ |
| lequ1_3131 | $\left(ar{\ell}_3 e_1 ight)\epsilon_{jk}\left(ar{q}_3 u_1 ight)$       | $\mathbf{C}$ |
| lequ1_3132 | $\left(ar{\ell}_3 e_1 ight)\epsilon_{jk}\left(ar{q}_3 u_2 ight)$       | $\mathbf{C}$ |
| lequ1_3133 | $\left(ar{\ell}_3 e_1\right) \epsilon_{jk} \left(ar{q}_3 u_3 ight)$    | $\mathbf{C}$ |
| lequ1_3211 | $\left(ar{\ell}_3 e_2\right) \epsilon_{jk} \left(ar{q}_1 u_1 ight)$    | $\mathbf{C}$ |
| lequ1_3212 | $(ar{\ell}_3 e_2)  \epsilon_{jk}  (ar{q}_1 u_2)$                       | $\mathbf{C}$ |
| lequ1_3213 | $\left(ar{\ell}_3 e_2\right) \epsilon_{jk} \left(ar{q}_1 u_3 ight)$    | $\mathbf{C}$ |
| lequ1_3221 | $\left(ar{\ell}_3 e_2 ight)\epsilon_{jk}\left(ar{q}_2 u_1 ight)$       | $\mathbf{C}$ |
| lequ1_3222 | $\left(ar{\ell}_{3}e_{2} ight)\epsilon_{jk}\left(ar{q}_{2}u_{2} ight)$ | $\mathbf{C}$ |
| lequ1_3223 | $(ar{\ell}_3 e_2) \epsilon_{jk} (ar{q}_2 u_3)$                         | $\mathbf{C}$ |
| lequ1_3231 | $(ar{\ell}_3 e_2)  \epsilon_{jk}  (ar{q}_3 u_1)$                       | $\mathbf{C}$ |
| lequ1_3232 | $(ar{\ell}_3 e_2)  \epsilon_{jk}  (ar{q}_3 u_2)$                       | $\mathbf{C}$ |
|            |  |              |

| WC name    | Operator   | Type         |
|------------|--|--------------|
| lequ1_3233 | $(\bar{\ell}_3 e_2)  \epsilon_{jk}  (\bar{q}_3 u_3)$   | C            |
| lequ1_3311 | $(\bar{\ell}_3 e_3) \epsilon_{jk} (\bar{q}_1 u_1)$   | $\mathbf{C}$ |
| lequ1_3312 | $\left(ar{\ell}_3 e_3 ight)\epsilon_{jk}\left(ar{q}_1 u_2 ight)$   | $\mathbf{C}$ |
| lequ1_3313 | $\left(ar{\ell}_3 e_3\right) \epsilon_{jk} \left(ar{q}_1 u_3 ight)$                                      | $\mathbf{C}$ |
| lequ1_3321 | $\left(ar{\ell}_3 e_3\right) \epsilon_{jk} \left(ar{q}_2 u_1 ight)$                                      | $\mathbf{C}$ |
| lequ1_3322 | $\left(ar{\ell}_3 e_3 ight)\epsilon_{jk}\left(ar{q}_2 u_2 ight)$   | $\mathbf{C}$ |
| lequ1_3323 | $\left(ar{\ell}_3 e_3\right) \epsilon_{jk} \left(ar{q}_2 u_3 ight)$                                      | $\mathbf{C}$ |
| lequ1_3331 | $\left(ar{\ell}_3 e_3\right) \epsilon_{jk} \left(ar{q}_3 u_1 ight)$                                      | $\mathbf{C}$ |
| lequ1_3332 | $\left(ar{\ell}_3 e_3 ight) \epsilon_{jk} \left(ar{q}_3 u_2 ight)$                                       | $\mathbf{C}$ |
| lequ1_3333 | $\left(ar{\ell}_3 e_3 ight)\epsilon_{jk}\left(ar{q}_3 u_3 ight)$   | $\mathbf{C}$ |
| lequ3_1111 | $\left(ar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_1112 | $\left(ar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1113 | $\left(ar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_1121 | $\left(ar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_1122 | $\left(ar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1123 | $\left( \ell_1 \sigma_{\mu  u} e_1  ight) \epsilon_{jk} \left( ar{q}_2 \sigma^{\mu  u} u_3  ight)$       | $\mathbf{C}$ |
| lequ3_1131 | $\left(ar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_1132 | $\left(ar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1133 | $\left(\bar{\ell}_1\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(\bar{q}_3\sigma^{\mu u}u_3 ight)$           | $\mathbf{C}$ |
| lequ3_1211 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_1212 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1213 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_1221 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_1222 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1223 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_1231 | $\left(\bar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(\bar{q}_3\sigma^{\mu u}u_1 ight)$           | $\mathbf{C}$ |
| lequ3_1232 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1233 | $\left(ar{\ell}_1\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_1311 | $\left(ar{\ell}_{1}\sigma_{\mu u}e_{3} ight)\epsilon_{jk}\left(ar{q}_{1}\sigma^{\mu u}u_{1} ight)$       | $\mathbf{C}$ |
| lequ3_1312 | $\left( \ell_1 \sigma_{\mu  u} e_3  ight) \epsilon_{jk} \left( ar{q}_1 \sigma^{\mu  u} u_2  ight)$       | $\mathbf{C}$ |
| lequ3_1313 | $\left(ar{\ell}_1\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_1321 | $\left(ar{\ell}_1\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_1322 | $\left(ar{\ell}_1\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1323 | $\left(ar{\ell}_1\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_1331 | $\left(ar{\ell}_1\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_1332 | $\left(ar{\ell}_1\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_1333 | $\left(ar{\ell}_1\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_2111 | $\left(ar{\ell}_2\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_1 ight)$               | $\mathbf{C}$ |
| lequ3_2112 | $\left(ar{\ell}_2\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_2 ight)$               | $\mathbf{C}$ |
| lequ3_2113 | $\left(ar{\ell}_2\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_3 ight)$               | $\mathbf{C}$ |
| lequ3_2121 | $\left(\bar{\ell}_2 \sigma_{\mu\nu} e_1\right) \epsilon_{jk} \left(\bar{q}_2 \sigma^{\mu\nu} u_1\right)$ | $\mathbf{C}$ |
| lequ3_2122 | $\left(\bar{\ell}_2 \sigma_{\mu\nu} e_1\right) \epsilon_{jk} \left(\bar{q}_2 \sigma^{\mu\nu} u_2\right)$ | $\mathbf{C}$ |

| lequ3_2133  | WC name    | Operator   | Type            |
|---|------------|--|-----------------|
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | legu3 2123 | $(\bar{\ell}_2\sigma_{\mu\nu}e_1)\epsilon_{ik}(\bar{q}_2\sigma^{\mu\nu}u_3)$                       |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2\sigma_{\mu\nu}e_1)\epsilon_{ik}(\bar{q}_3\sigma^{\mu\nu}u_1)$                       |                 |
| $\begin{array}{c} \operatorname{lequ3}_{2133} & (\bar{\ell}_2 \sigma_{\mu\nu} e_1) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_3) \\ \operatorname{lequ3}_{2211} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{2212} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{2213} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_3) \\ \operatorname{lequ3}_{2221} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_2 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{2222} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_2 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{2222} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_2 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{2223} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{2223} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{2223} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{22232} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{22233} & (\bar{\ell}_2 \sigma_{\mu\nu} e_2) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{22331} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{2311} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{2312} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{23212} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_2 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{23222} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_2 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{23232} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_2 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{23331} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{23332} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_3) \\ \operatorname{lequ3}_{23332} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{23332} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{23332} & (\bar{\ell}_2 \sigma_{\mu\nu} e_3) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{23331} & (\bar{\ell}_3 \sigma_{\mu\nu} e_1) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{3111} & (\bar{\ell}_3 \sigma_{\mu\nu} e_1) \; \epsilon_{jk} \; (\bar{q}_1 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{31212} & (\bar{\ell}_3 \sigma_{\mu\nu} e_1) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{3122} & (\bar{\ell}_3 \sigma_{\mu\nu} e_1) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_1) \\ \operatorname{lequ3}_{3122} & (\bar{\ell}_3 \sigma_{\mu\nu} e_1) \; \epsilon_{jk} \; (\bar{q}_3 \sigma^{\mu\nu} u_2) \\ \operatorname{lequ3}_{32121} & (\bar{\ell}_3 \sigma_{\mu\nu} e_2)$ |            | $(\bar{\ell}_2\sigma_{\mu\nu}e_1)\epsilon_{ik}(\bar{q}_3\sigma^{\mu\nu}u_2)$                       |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2 \sigma_{\mu\nu} e_1) \epsilon_{ik} (\bar{q}_3 \sigma^{\mu\nu} u_3)$                 |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2\sigma_{\mu\nu}e_2)\epsilon_{ik}(\bar{q}_1\sigma^{\mu\nu}u_1)$                       |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2\sigma_{\mu\nu}e_2)\epsilon_{ik}(\bar{q}_1\sigma^{\mu\nu}u_2)$                       |                 |
| lequ3_2221 $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_1)$ C         lequ3_2222 $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2231 $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_3)$ C         lequ3_2232 $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_3)$ C         lequ3_2233 $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_2231 $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$ C         lequ3_2311 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$ C         lequ3_2312 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$ C         lequ3_2313 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2313 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2321 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2322 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2323 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2323 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         <   |            | $(\bar{\ell}_2\sigma_{\mu\nu}e_2)\epsilon_{ik}(\bar{q}_1\sigma^{\mu\nu}u_3)$                       |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{ik} (\bar{q}_2 \sigma^{\mu\nu} u_1)$                 |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2\sigma_{\mu\nu}e_2)\epsilon_{ik}(\bar{q}_2\sigma^{\mu\nu}u_2)$                       | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{ik} (\bar{q}_2 \sigma^{\mu\nu} u_3)$                 |                 |
| $\begin{array}{llllllllllllllllllllllllllllllllllll$  |            | $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{ik} (\bar{q}_3 \sigma^{\mu\nu} u_1)$                 | $^{\mathrm{C}}$ |
| $\begin{array}{llllllllllllllllllllllllllllllllllll$  |            | $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{ik} (\bar{q}_3 \sigma^{\mu\nu} u_2)$                 | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | =          | $(\bar{\ell}_2 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_3)$                 | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_1)$                 | $\mathbf{C}$    |
| lequ3_2313 $(\ell_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_3)$ C         lequ3_2321 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_1)$ C         lequ3_2322 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_3)$ C         lequ3_2332 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_1)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_23111 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_1)$ C         lequ3_3112 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$ C         lequ3_3123 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_1)$ C         lequ3_3123 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_3131 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_3132 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_3213 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_3211 $(\bar{\ell}_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$ C <td< td=""><td></td><td><math>(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)</math></td><td><math>\mathbf{C}</math></td></td<>   |            | $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$                 | $\mathbf{C}$    |
| lequ3_2321 $(\ell_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2322 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_2323 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_3)$ C         lequ3_2331 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_1)$ C         lequ3_2332 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_2333 $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_3)$ C         lequ3_3111 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_1)$ C         lequ3_3112 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$ C         lequ3_3113 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_3)$ C         lequ3_3121 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_2)$ C         lequ3_3122 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_2 \sigma^{\mu\nu} u_3)$ C         lequ3_3133 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_1)$ C         lequ3_3133 $(\bar{\ell}_3 \sigma_{\mu\nu} e_1) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_1)$ C         lequ3_3211 $(\bar{\ell}_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_1)$ C         lequ3_3212 $(\bar{\ell}_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_2)$ C   | lequ3_2313 | $(\bar{\ell}_2 \sigma_{\mu\nu} e_3) \epsilon_{jk} (\bar{q}_1 \sigma^{\mu\nu} u_3)$                 | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2 \sigma_{\mu  u} e_3)  \epsilon_{jk}  (\bar{q}_2 \sigma^{\mu  u} u_1)$               | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  |            | $(\bar{\ell}_2 \sigma_{\mu \nu} e_3)  \epsilon_{jk}  (\bar{q}_2 \sigma^{\mu \nu} u_2)$             | $\mathbf{C}$    |
| $\begin{array}{llllllllllllllllllllllllllllllllllll$  | lequ3_2323 | $(\bar{\ell}_2 \sigma_{\mu  u} e_3)  \epsilon_{jk}  (\bar{q}_2 \sigma^{\mu  u} u_3)$               | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_2331 | $(\bar{\ell}_2 \sigma_{\mu  u} e_3)  \epsilon_{jk}  (\bar{q}_3 \sigma^{\mu  u} u_1)$               | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_2332 | $(ar{\ell}_2\sigma_{\mu u}e_3)\epsilon_{jk}(ar{q}_3\sigma^{\mu u}u_2)$                             | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_2333 | $(\bar{\ell}_2 \sigma_{\mu  u} e_3)  \epsilon_{jk}  (\bar{q}_3 \sigma^{\mu  u} u_3)$               | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3111 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_1 ight)$         | $\mathbf{C}$    |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3112 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_2 ight)$         | С               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3113 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_3 ight)$         | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3121 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_1 ight)$         |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3122 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_2 ight)$         | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3123 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_3 ight)$         | $^{\mathrm{C}}$ |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3131 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_1 ight)$         |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3132 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_2 ight)$         |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3133 | $\left(ar{\ell}_3\sigma_{\mu u}e_1 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_3 ight)$         |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3211 | $\left(ar{\ell}_3\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_1 ight)$         |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3212 | $\left(ar{\ell}_3\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_2 ight)$         |                 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3213 | $\left(ar{\ell}_3\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_3 ight)$         | С               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3221 |  | C               |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | lequ3_3222 | $\left(ar{\ell}_3\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_2 ight)$         | С               |
| lequ3_3231 $(\bar{\ell}_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_1)$ C         lequ3_3232 $(\bar{\ell}_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C         lequ3_3233 $(\bar{\ell}_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_3)$ C   | lequ3_3223 |  |                 |
| lequ3_3232 $(\ell_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_2)$ C<br>lequ3_3233 $(\bar{\ell}_3 \sigma_{\mu\nu} e_2) \epsilon_{jk} (\bar{q}_3 \sigma^{\mu\nu} u_3)$ C  | lequ3_3231 | $\left(ar{\ell}_3\sigma_{\mu u}e_2\right)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_1 ight)$        |                 |
| lequ3_3233 $ \left(\underline{\ell}_3 \sigma_{\mu\nu} e_2\right) \epsilon_{jk} \left(\overline{q}_3 \sigma^{\mu\nu} u_3\right) $ C  |            | $\left(\ell_{3}\sigma_{\mu\nu}e_{2}\right)\epsilon_{jk}\left(ar{q}_{3}\sigma^{\mu\nu}u_{2}\right)$ |                 |
| legu3 3311 $(\bar{\ell}_2\sigma_{\cdots}e_2)\epsilon_{ik}(\bar{q}_1\sigma^{\mu\nu}u_1)$ C   | lequ3_3233 | $\left(ar{\ell}_3\sigma_{\mu u}e_2 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_3 ight)$         |                 |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \   | lequ3_3311 | $\left(ar{\ell}_3\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_1 ight)$         | $^{\mathrm{C}}$ |
| lequ3_3312 $\left(\bar{\ell}_3\sigma_{\mu\nu}e_3\right)\epsilon_{jk}\left(\bar{q}_1\sigma^{\mu\nu}u_2\right)$ C   | lequ3_3312 | $\left(ar{\ell}_3\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_1\sigma^{\mu u}u_2 ight)$         | $^{\mathrm{C}}$ |

| WC name    | Operator   | Type            |
|------------|--|-----------------|
| lequ3_3313 | $\left(\bar{\ell}_3\sigma_{\mu\nu}e_3\right)\epsilon_{jk}\left(\bar{q}_1\sigma^{\mu\nu}u_3\right)$ | C               |
| lequ3_3321 | $\left(ar{\ell}_3\sigma_{\mu u}e_3\right)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_1 ight)$        | $\mathbf{C}$    |
| lequ3_3322 | $\left(ar{\ell}_3\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_2\sigma^{\mu u}u_2 ight)$         | $\mathbf{C}$    |
| lequ3_3323 | $(\bar{\ell}_3 \sigma_{\mu  u} e_3)  \epsilon_{jk}  (\bar{q}_2 \sigma^{\mu  u} u_3)$               | $^{\mathrm{C}}$ |
| lequ3_3331 | $\left(\bar{\ell}_3\sigma_{\mu\nu}e_3\right)\epsilon_{jk}\left(\bar{q}_3\sigma^{\mu\nu}u_1 ight)$  | $\mathbf{C}$    |
| lequ3_3332 | $\left(ar{\ell}_3\sigma_{\mu u}e_3 ight)\epsilon_{jk}\left(ar{q}_3\sigma^{\mu u}u_2 ight)$         | $\mathbf{C}$    |
| lequ3_3333 | $(ar{\ell}_3\sigma_{\mu u}e_3)\epsilon_{jk}(ar{q}_3\sigma^{\mu u}u_3)$                             | $^{\mathrm{C}}$ |

## dB=dL=1

| WC name   | Operator   | Type            |
|-----------|--|-----------------|
| duql_1111 | $(d_1 C u_1) (q_1 C \ell_1)$                       | C               |
| duql_1112 | $(d_1Cu_1)(q_1C\ell_2)$                            | $\mathbf{C}$    |
| duql_1113 | $(d_1Cu_1)(q_1C\ell_3)$                            | C               |
| duql_1121 | $(d_1 C u_1) \left( q_2 C \ell_1 \right)$          | С               |
| duql_1122 | $(d_1 C u_1) \left( q_2 C \ell_2 \right)$          | C               |
| duql_1123 | $(d_1Cu_1)(q_2C\ell_3)$                            | C               |
| duql_1131 | $(d_1 C u_1) \left( q_3 C \ell_1 \right)$          | C               |
| duql_1132 | $(d_1 C u_1) \left( q_3 C \ell_2 \right)$          | C               |
| duql_1133 | $(d_1Cu_1)(q_3C\ell_3)$                            | $^{\mathrm{C}}$ |
| duql_1211 | $\left(d_1 C u_2\right) \left(q_1 C \ell_1\right)$ | $^{\mathrm{C}}$ |
| duql_1212 | $(d_1 C u_2) (q_1 C \ell_2)$                       | $^{\mathrm{C}}$ |
| duql_1213 | $(d_1Cu_2)(q_1C\ell_3)$                            | $^{\mathrm{C}}$ |
| duql_1221 | $(d_1 C u_2) (q_2 C \ell_1)$                       | $^{\mathrm{C}}$ |
| duql_1222 | $(d_1 C u_2) (q_2 C \ell_2)$                       | $^{\mathrm{C}}$ |
| duql_1223 | $(d_1 C u_2) (q_2 C \ell_3)$                       | $^{\mathrm{C}}$ |
| duql_1231 | $(d_1 C u_2) (q_3 C \ell_1)$                       | $^{\mathrm{C}}$ |
| duql_1232 | $(d_1Cu_2)(q_3C\ell_2)$                            | $^{\mathrm{C}}$ |
| duql_1233 | $(d_1Cu_2)(q_3C\ell_3)$                            | $^{\mathrm{C}}$ |
| duql_1311 | $(d_1Cu_3)(q_1C\ell_1)$                            | $^{\mathrm{C}}$ |
| duql_1312 | $(d_1Cu_3)(q_1C\ell_2)$                            | $^{\mathrm{C}}$ |
| duql_1313 | $(d_1Cu_3)(q_1C\ell_3)$                            | $^{\mathrm{C}}$ |
| duql_1321 | $(d_1Cu_3)(q_2C\ell_1)$                            | $^{\mathrm{C}}$ |
| duql_1322 | $(d_1Cu_3)(q_2C\ell_2)$                            | C               |
| duql_1323 | $(d_1Cu_3)(q_2C\ell_3)$                            | $^{\mathrm{C}}$ |
| duql_1331 | $(d_1Cu_3)(q_3C\ell_1)$                            | C               |
| duql_1332 | $(d_1Cu_3)(q_3C\ell_2)$                            | $^{\mathrm{C}}$ |
| duql_1333 | $(d_1Cu_3)(q_3C\ell_3)$                            | $^{\mathrm{C}}$ |
| duql_2111 | $(d_2Cu_1)(q_1C\ell_1)$                            | C               |
| duql_2112 | $(d_2Cu_1)(q_1C\ell_2)$                            | C               |
| duq1_2113 | $(d_2Cu_1)(q_1C\ell_3)$                            | C               |
| duql_2121 | $(d_2Cu_1)(q_2C\ell_1)$                            | $^{\mathrm{C}}$ |

| WC name   | Operator  | Type            |
|-----------|---|-----------------|
| duq1_2122 | $\left(d_{2}Cu_{1}\right)\left(q_{2}C\ell_{2}\right)$ | С               |
| duq1_2123 | $(d_2Cu_1)(q_2C\ell_3)$                               | $^{\mathrm{C}}$ |
| duq1_2131 | $\left(d_{2}Cu_{1}\right)\left(q_{3}C\ell_{1}\right)$ | $^{\mathrm{C}}$ |
| duq1_2132 | $\left(d_{2}Cu_{1}\right)\left(q_{3}C\ell_{2}\right)$ | $^{\mathrm{C}}$ |
| duq1_2133 | $(d_2Cu_1)(q_3C\ell_3)$                               | $\mathbf{C}$    |
| duq1_2211 | $\left(d_{2}Cu_{2}\right)\left(q_{1}C\ell_{1}\right)$ | $^{\mathrm{C}}$ |
| duq1_2212 | $(d_2Cu_2)(q_1C\ell_2)$                               | $\mathbf{C}$    |
| duq1_2213 | $(d_2Cu_2)(q_1C\ell_3)$                               | $\mathbf{C}$    |
| duq1_2221 | $(d_2Cu_2)(q_2C\ell_1)$                               | $\mathbf{C}$    |
| duq1_2222 | $(d_2Cu_2)(q_2C\ell_2)$                               | $\mathbf{C}$    |
| duq1_2223 | $(d_2Cu_2)(q_2C\ell_3)$                               | $\mathbf{C}$    |
| duq1_2231 | $(d_2Cu_2)(q_3C\ell_1)$                               | $\mathbf{C}$    |
| duq1_2232 | $(d_2Cu_2)(q_3C\ell_2)$                               | $\mathbf{C}$    |
| duq1_2233 | $(d_2Cu_2)(q_3C\ell_3)$                               | $\mathbf{C}$    |
| duq1_2311 | $(d_2Cu_3)(q_1C\ell_1)$                               | $\mathbf{C}$    |
| duq1_2312 | $(d_2Cu_3)(q_1C\ell_2)$                               | $\mathbf{C}$    |
| duq1_2313 | $(d_2Cu_3)(q_1C\ell_3)$                               | $\mathbf{C}$    |
| duq1_2321 | $(d_2Cu_3)(q_2C\ell_1)$                               | $\mathbf{C}$    |
| duq1_2322 | $(d_2Cu_3)(q_2C\ell_2)$                               | $\mathbf{C}$    |
| duq1_2323 | $(d_2Cu_3)(q_2C\ell_3)$                               | $\mathbf{C}$    |
| duq1_2331 | $(d_2Cu_3)(q_3C\ell_1)$                               | $\mathbf{C}$    |
| duq1_2332 | $(d_2Cu_3)(q_3C\ell_2)$                               | $\mathbf{C}$    |
| duq1_2333 | $(d_2Cu_3)(q_3C\ell_3)$                               | $\mathbf{C}$    |
| duq1_3111 | $(d_3Cu_1)(q_1C\ell_1)$                               | $\mathbf{C}$    |
| duq1_3112 | $(d_3Cu_1)(q_1C\ell_2)$                               | $\mathbf{C}$    |
| duq1_3113 | $(d_3Cu_1)(q_1C\ell_3)$                               | $\mathbf{C}$    |
| duq1_3121 | $(d_3Cu_1)(q_2C\ell_1)$                               | $\mathbf{C}$    |
| duq1_3122 | $(d_3Cu_1)(q_2C\ell_2)$                               | C               |
| duq1_3123 | $(d_3Cu_1)(q_2C\ell_3)$                               | C               |
| duq1_3131 | $(d_3Cu_1)(q_3C\ell_1)$                               | C               |
| duq1_3132 | $(d_3Cu_1)(q_3C\ell_2)$                               | C               |
| duq1_3133 | $(d_3Cu_1)(q_3C\ell_3)$                               | C               |
| duq1_3211 | $(d_3Cu_2)(q_1C\ell_1)$                               | C               |
| duq1_3212 | $(d_3Cu_2)(q_1C\ell_2)$                               | C               |
| duq1_3213 | $(d_3Cu_2)(q_1C\ell_3)$                               | C               |
| duq1_3221 | $(d_3Cu_2)(q_2C\ell_1)$                               | C               |
| duq1_3222 | $(d_3Cu_2)(q_2C\ell_2)$                               | C               |
| duq1_3223 | $(d_3Cu_2)(q_2C\ell_3)$                               | C               |
| duq1_3231 | $(d_3Cu_2)(q_3C\ell_1)$                               | C               |
| duq1_3232 | $(d_3Cu_2)(q_3C\ell_2)$                               | С               |
| duq1_3233 | $(d_3Cu_2)(q_3C\ell_3)$                               | С               |
| duq1_3311 | $(d_3Cu_3)(q_1C\ell_1)$                               | C               |
| duq1_3312 | $(d_3Cu_3)(q_1C\ell_2)$                               | C               |
| duq1_3313 | $(d_3Cu_3)(q_1C\ell_3)$                               | $\mathbf{C}$    |

| WC name   | Operator   | Type                       |
|-----------|--|----------------------------|
| duq1_3321 | $(d_3Cu_3)(q_2C\ell_1)$                            | C                          |
| duq1_3322 | $(d_3Cu_3)(q_2C\ell_2)$                            | $\mathbf{C}$               |
| duq1_3323 | $(d_3Cu_3)(q_2C\ell_3)$                            | $\mathbf{C}$               |
| duq1_3331 | $(d_3Cu_3)(q_3C\ell_1)$                            | $\mathbf{C}$               |
| duq1_3332 | $(d_3Cu_3)(q_3C\ell_2)$                            | $\mathbf{C}$               |
| duq1_3333 | $(d_3Cu_3)(q_3C\ell_3)$                            | $\mathbf{C}$               |
| qque_1111 | $\left(q_{1}Cq_{1}\right)\left(u_{1}Ce_{1}\right)$ | $\mathbf{C}$               |
| qque_1112 | $\left(q_{1}Cq_{1}\right)\left(u_{1}Ce_{2}\right)$ | $\mathbf{C}$               |
| qque_1113 | $(q_1Cq_1)(u_1Ce_3)$                               | $\mathbf{C}$               |
| qque_1121 | $(q_1Cq_1)(u_2Ce_1)$                               | $\mathbf{C}$               |
| qque_1122 | $(q_1Cq_1)(u_2Ce_2)$                               | $\mathbf{C}$               |
| qque_1123 | $(q_1Cq_1)(u_2Ce_3)$                               | $\mathbf{C}$               |
| qque_1131 | $(q_1Cq_1)\left(u_3Ce_1\right)$                    | $\mathbf{C}$               |
| qque_1132 | $(q_1Cq_1)(u_3Ce_2)$                               | $\mathbf{C}$               |
| qque_1133 | $(q_1Cq_1)(u_3Ce_3)$                               | $\mathbf{C}$               |
| qque_1211 | $(q_1Cq_2)(u_1Ce_1)$                               | $\mathbf{C}$               |
| qque_1212 | $(q_1Cq_2)(u_1Ce_2)$                               | $\mathbf{C}$               |
| qque_1213 | $(q_1Cq_2)(u_1Ce_3)$                               | $\mathbf{C}$               |
| qque_1221 | $(q_1Cq_2)(u_2Ce_1)$                               | $\mathbf{C}$               |
| qque_1222 | $(q_1Cq_2)(u_2Ce_2)$                               | $\mathbf{C}$               |
| qque_1223 | $(q_1Cq_2)(u_2Ce_3)$                               | C                          |
| qque_1231 | $(q_1Cq_2)(u_3Ce_1)$                               | C                          |
| qque_1232 | $(q_1Cq_2)(u_3Ce_2)$                               | C                          |
| qque_1233 | $(q_1Cq_2)(u_3Ce_3)$                               | C                          |
| qque_1311 | $(q_1Cq_3)(u_1Ce_1)$                               | C                          |
| qque_1312 | $(q_1Cq_3)(u_1Ce_2)$                               | C                          |
| qque_1313 | $(q_1Cq_3)(u_1Ce_3)$                               | C                          |
| qque_1321 | $(q_1Cq_3)(u_2Ce_1)$                               | C                          |
| qque_1322 | $(q_1Cq_3)(u_2Ce_2)$                               | $\stackrel{	ext{C}}{\sim}$ |
| qque_1323 | $(q_1Cq_3)(u_2Ce_3)$                               | C                          |
| qque_1331 | $(q_1Cq_3)(u_3Ce_1)$                               | C                          |
| qque_1332 | $(q_1Cq_3)(u_3Ce_2)$                               | C                          |
| qque_1333 | $(q_1Cq_3)(u_3Ce_3)$                               | C                          |
| qque_2211 | $(q_2Cq_2)(u_1Ce_1)$                               | C                          |
| qque_2212 | $(q_2Cq_2)(u_1Ce_2)$                               | C                          |
| qque_2213 | $(q_2Cq_2)(u_1Ce_3)$                               | C                          |
| qque_2221 | $(q_2Cq_2)(u_2Ce_1)$                               | С                          |
| qque_2222 | $(q_2Cq_2)(u_2Ce_2)$                               | С                          |
| qque_2223 | $(q_2Cq_2)(u_2Ce_3)$                               | С                          |
| qque_2231 | $(q_2Cq_2)(u_3Ce_1)$                               | С                          |
| qque_2232 | $(q_2Cq_2)(u_3Ce_2)$                               | С                          |
| qque_2233 | $(q_2Cq_2)(u_3Ce_3)$                               | С                          |
| qque_2311 | $(q_2Cq_3)(u_1Ce_1)$                               | C<br>C                     |
| qque_2312 | $(q_2Cq_3)(u_1Ce_2)$                               | C                          |

| WC name   | Operator  | Type            |
|-----------|---|-----------------|
| qque_2313 | $(q_2Cq_3)(u_1Ce_3)$  | С               |
| qque_2321 | $(q_2Cq_3)(u_2Ce_1)$  | $^{\mathrm{C}}$ |
| qque_2322 | $(q_2Cq_3)(u_2Ce_2)$  | $^{\mathrm{C}}$ |
| qque_2323 | $(q_2Cq_3)(u_2Ce_3)$  | $^{\mathrm{C}}$ |
| qque_2331 | $\left(q_{2}Cq_{3}\right)\left(u_{3}Ce_{1}\right)$                              | $^{\mathrm{C}}$ |
| qque_2332 | $(q_2Cq_3)(u_3Ce_2)$  | $^{\mathrm{C}}$ |
| qque_2333 | $(q_2Cq_3)(u_3Ce_3)$  | $^{\mathrm{C}}$ |
| qque_3311 | $\left(q_3Cq_3\right)\left(u_1Ce_1\right)$                                      | $^{\mathrm{C}}$ |
| qque_3312 | $(q_3Cq_3)(u_1Ce_2)$  | $^{\mathrm{C}}$ |
| qque_3313 | $(q_3Cq_3)(u_1Ce_3)$  | $^{\mathrm{C}}$ |
| qque_3321 | $(q_3Cq_3)(u_2Ce_1)$  | $^{\mathrm{C}}$ |
| qque_3322 | $(q_3Cq_3)(u_2Ce_2)$  | C               |
| qque_3323 | $(q_3Cq_3)(u_2Ce_3)$  | C               |
| qque_3331 | $\left(q_3Cq_3\right)\left(u_3Ce_1\right)$                                      | C               |
| qque_3332 | $(q_3Cq_3)(u_3Ce_2)$  | C               |
| qque_3333 | $(q_3Cq_3)(u_3Ce_3)$  | C               |
| qqql_1111 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{1}C\ell_{1}\right)$ | C               |
| qqql_1112 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{1}C\ell_{2}\right)$ | C               |
| qqql_1113 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{1}C\ell_{3}\right)$ | C               |
| qqql_1121 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{2}C\ell_{1}\right)$ | C               |
| qqql_1122 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{2}C\ell_{2}\right)$ | C               |
| qqql_1123 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{2}C\ell_{3}\right)$ | C               |
| qqql_1131 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{3}C\ell_{1}\right)$ | C               |
| qqql_1132 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{3}C\ell_{2}\right)$ | C               |
| qqql_1133 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{1}\right)\left(q_{3}C\ell_{3}\right)$ | C               |
| qqql_1211 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{1}C\ell_{1}\right)$ | C               |
| qqql_1212 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{1}C\ell_{2}\right)$ | C               |
| qqql_1213 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{1}C\ell_{3}\right)$ | C               |
| qqql_1221 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{2}C\ell_{1}\right)$ | C               |
| qqql_1222 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{2}C\ell_{2}\right)$ | C               |
| qqql_1223 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{2}C\ell_{3}\right)$ | C               |
| qqq1_1231 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{3}C\ell_{1}\right)$ | C               |
| qqq1_1232 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{3}C\ell_{2}\right)$ | C               |
| qqq1_1233 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{2}\right)\left(q_{3}C\ell_{3}\right)$ | C               |
| qqql_1311 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{1}C\ell_{1}\right)$ | C               |
| qqql_1312 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{1}C\ell_{2}\right)$ | C               |
| qqql_1313 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{1}C\ell_{3}\right)$ | C               |
| qqql_1321 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{2}C\ell_{1}\right)$ | C               |
| qqql_1322 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{2}C\ell_{2}\right)$ | C               |
| qqql_1323 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{2}C\ell_{3}\right)$ | C               |
| qqql_1331 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{3}C\ell_{1}\right)$ | C               |
| qqql_1332 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{3}C\ell_{2}\right)$ | C               |
| qqql_1333 | $\epsilon_{il}\epsilon_{jk}\left(q_{1}Cq_{3}\right)\left(q_{3}C\ell_{3}\right)$ | C               |
| qqql_2121 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{1} ight)\left(q_{2}C\ell_{1} ight)$   | $\mathbf{C}$    |
|           |   |                 |

| WC name   | Operator  | Type            |
|-----------|---|-----------------|
| qqq1_2122 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{1} ight)\left(q_{2}C\ell_{2} ight)$   | С               |
| qqql_2123 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{1}\right)\left(q_{2}C\ell_{3}\right)$ | $^{\mathrm{C}}$ |
| qqq1_2131 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{1} ight)\left(q_{3}C\ell_{1} ight)$   | $^{\mathrm{C}}$ |
| qqq1_2132 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{1} ight)\left(q_{3}C\ell_{2} ight)$   | $^{\mathrm{C}}$ |
| qqql_2133 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{1} ight)\left(q_{3}C\ell_{3} ight)$   | $\mathbf{C}$    |
| qqq1_2221 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{2} ight)\left(q_{2}C\ell_{1} ight)$   | $\mathbf{C}$    |
| qqq1_2222 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{2} ight)\left(q_{2}C\ell_{2} ight)$   | $\mathbf{C}$    |
| qqq1_2223 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{2} ight)\left(q_{2}C\ell_{3} ight)$   | $\mathbf{C}$    |
| qqq1_2231 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{2} ight)\left(q_{3}C\ell_{1} ight)$   | $\mathbf{C}$    |
| qqq1_2232 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{2} ight)\left(q_{3}C\ell_{2} ight)$   | $\mathbf{C}$    |
| qqq1_2233 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{2} ight)\left(q_{3}C\ell_{3} ight)$   | $\mathbf{C}$    |
| qqql_2311 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{1}C\ell_{1} ight)$   | $\mathbf{C}$    |
| qqq1_2312 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{1}C\ell_{2} ight)$   | $^{\mathrm{C}}$ |
| qqql_2313 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{1}C\ell_{3} ight)$   | $^{\mathrm{C}}$ |
| qqq1_2321 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{2}C\ell_{1} ight)$   | $^{\mathrm{C}}$ |
| qqq1_2322 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{2}C\ell_{2} ight)$   | $^{\mathrm{C}}$ |
| qqq1_2323 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{2}C\ell_{3} ight)$   | $^{\mathrm{C}}$ |
| qqq1_2331 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{3}C\ell_{1} ight)$   | $^{\mathrm{C}}$ |
| qqq1_2332 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{3}C\ell_{2} ight)$   | $^{\mathrm{C}}$ |
| qqq1_2333 | $\epsilon_{il}\epsilon_{jk}\left(q_{2}Cq_{3} ight)\left(q_{3}C\ell_{3} ight)$   | $^{\mathrm{C}}$ |
| qqql_3131 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{1} ight)\left(q_{3}C\ell_{1} ight)$   | $^{\mathrm{C}}$ |
| qqql_3132 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{1} ight)\left(q_{3}C\ell_{2} ight)$   | $^{\mathrm{C}}$ |
| qqql_3133 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{1} ight)\left(q_{3}C\ell_{3} ight)$   | $^{\mathrm{C}}$ |
| qqq1_3231 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{2} ight)\left(q_{3}C\ell_{1} ight)$   | $^{\mathrm{C}}$ |
| qqq1_3232 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{2} ight)\left(q_{3}C\ell_{2} ight)$   | $^{\mathrm{C}}$ |
| qqq1_3233 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{2} ight)\left(q_{3}C\ell_{3} ight)$   | $^{\mathrm{C}}$ |
| qqq1_3331 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{3}\right)\left(q_{3}C\ell_{1}\right)$ | $^{\mathrm{C}}$ |
| qqq1_3332 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{3} ight)\left(q_{3}C\ell_{2} ight)$   | $^{\mathrm{C}}$ |
| qqq1_3333 | $\epsilon_{il}\epsilon_{jk}\left(q_{3}Cq_{3} ight)\left(q_{3}C\ell_{3} ight)$   | $^{\mathrm{C}}$ |
| duue_1111 | $(d_1Cu_1)\left(u_1Ce_1\right)$   | $\mathbf{C}$    |
| duue_1112 | $\left(d_{1}Cu_{1}\right)\left(u_{1}Ce_{2}\right)$                              | $\mathbf{C}$    |
| duue_1113 | $\left(d_{1}Cu_{1}\right)\left(u_{1}Ce_{3}\right)$                              | $\mathbf{C}$    |
| duue_1121 | $\left(d_{1}Cu_{1}\right)\left(u_{2}Ce_{1}\right)$                              | $\mathbf{C}$    |
| duue_1122 | $(d_1Cu_1)(u_2Ce_2)$  | $\mathbf{C}$    |
| duue_1123 | $\left(d_{1}Cu_{1}\right)\left(u_{2}Ce_{3}\right)$                              | $\mathbf{C}$    |
| duue_1131 | $(d_1Cu_1)(u_3Ce_1)$  | $^{\mathrm{C}}$ |
| duue_1132 | $(d_1Cu_1)(u_3Ce_2)$  | C               |
| duue_1133 | $(d_1Cu_1)(u_3Ce_3)$  | C               |
| duue_1211 | $(d_1Cu_2)(u_1Ce_1)$  | C               |
| duue_1212 | $(d_1Cu_2)(u_1Ce_2)$  | C               |
| duue_1213 | $(d_1Cu_2)(u_1Ce_3)$  | C               |
| duue_1221 | $(d_1Cu_2)(u_2Ce_1)$  | C               |
| duue_1222 | $(d_1Cu_2)(u_2Ce_2)$  | C               |
| duue_1223 | $\left(d_{1}Cu_{2}\right)\left(u_{2}Ce_{3}\right)$                              | С               |
|           |   |                 |

| WC name   | Operator   | Type         |
|-----------|--|--------------|
| duue_1231 | $(d_1Cu_2)(u_3Ce_1)$                               | С            |
| duue_1232 | $\left(d_{1}Cu_{2}\right)\left(u_{3}Ce_{2}\right)$ | $\mathbf{C}$ |
| duue_1233 | $\left(d_{1}Cu_{2}\right)\left(u_{3}Ce_{3}\right)$ | $\mathbf{C}$ |
| duue_1311 | $\left(d_{1}Cu_{3}\right)\left(u_{1}Ce_{1}\right)$ | $\mathbf{C}$ |
| duue_1312 | $\left(d_{1}Cu_{3}\right)\left(u_{1}Ce_{2}\right)$ | $\mathbf{C}$ |
| duue_1313 | $\left(d_{1}Cu_{3}\right)\left(u_{1}Ce_{3}\right)$ | $\mathbf{C}$ |
| duue_1321 | $\left(d_{1}Cu_{3}\right)\left(u_{2}Ce_{1}\right)$ | $\mathbf{C}$ |
| duue_1322 | $(d_1Cu_3)(u_2Ce_2)$                               | $\mathbf{C}$ |
| duue_1323 | $(d_1Cu_3)(u_2Ce_3)$                               | $\mathbf{C}$ |
| duue_1331 | $(d_1Cu_3)(u_3Ce_1)$                               | $\mathbf{C}$ |
| duue_1332 | $(d_1Cu_3)(u_3Ce_2)$                               | $\mathbf{C}$ |
| duue_1333 | $(d_1Cu_3)(u_3Ce_3)$                               | $\mathbf{C}$ |
| duue_2111 | $\left(d_{2}Cu_{1}\right)\left(u_{1}Ce_{1}\right)$ | $\mathbf{C}$ |
| duue_2112 | $\left(d_{2}Cu_{1}\right)\left(u_{1}Ce_{2}\right)$ | $\mathbf{C}$ |
| duue_2113 | $\left(d_{2}Cu_{1}\right)\left(u_{1}Ce_{3}\right)$ | $\mathbf{C}$ |
| duue_2121 | $\left(d_{2}Cu_{1}\right)\left(u_{2}Ce_{1}\right)$ | $\mathbf{C}$ |
| duue_2122 | $\left(d_{2}Cu_{1}\right)\left(u_{2}Ce_{2}\right)$ | $\mathbf{C}$ |
| duue_2123 | $\left(d_{2}Cu_{1}\right)\left(u_{2}Ce_{3}\right)$ | $\mathbf{C}$ |
| duue_2131 | $\left(d_{2}Cu_{1}\right)\left(u_{3}Ce_{1}\right)$ | $\mathbf{C}$ |
| duue_2132 | $\left(d_{2}Cu_{1}\right)\left(u_{3}Ce_{2}\right)$ | $\mathbf{C}$ |
| duue_2133 | $\left(d_{2}Cu_{1}\right)\left(u_{3}Ce_{3}\right)$ | $\mathbf{C}$ |
| duue_2211 | $(d_2Cu_2)(u_1Ce_1)$                               | $\mathbf{C}$ |
| duue_2212 | $(d_2Cu_2)(u_1Ce_2)$                               | $\mathbf{C}$ |
| duue_2213 | $(d_2Cu_2)(u_1Ce_3)$                               | $\mathbf{C}$ |
| duue_2221 | $(d_2Cu_2)(u_2Ce_1)$                               | $\mathbf{C}$ |
| duue_2222 | $(d_2Cu_2)(u_2Ce_2)$                               | $\mathbf{C}$ |
| duue_2223 | $(d_2Cu_2)(u_2Ce_3)$                               | $\mathbf{C}$ |
| duue_2231 | $(d_2Cu_2)(u_3Ce_1)$                               | $\mathbf{C}$ |
| duue_2232 | $(d_2Cu_2)(u_3Ce_2)$                               | $\mathbf{C}$ |
| duue_2233 | $(d_2Cu_2)(u_3Ce_3)$                               | $\mathbf{C}$ |
| duue_2311 | $(d_2Cu_3)(u_1Ce_1)$                               | $\mathbf{C}$ |
| duue_2312 | $(d_2Cu_3)(u_1Ce_2)$                               | $\mathbf{C}$ |
| duue_2313 | $(d_2Cu_3)(u_1Ce_3)$                               | $\mathbf{C}$ |
| duue_2321 | $(d_2Cu_3)(u_2Ce_1)$                               | $\mathbf{C}$ |
| duue_2322 | $(d_2Cu_3)(u_2Ce_2)$                               | $\mathbf{C}$ |
| duue_2323 | $(d_2Cu_3)(u_2Ce_3)$                               | $\mathbf{C}$ |
| duue_2331 | $(d_2Cu_3)(u_3Ce_1)$                               | С            |
| duue_2332 | $(d_2Cu_3)(u_3Ce_2)$                               | $\mathbf{C}$ |
| duue_2333 | $(d_2Cu_3)(u_3Ce_3)$                               | $\mathbf{C}$ |
| duue_3111 | $\left(d_3Cu_1\right)\left(u_1Ce_1\right)$         | C            |
| duue_3112 | $(d_3Cu_1)(u_1Ce_2)$                               | C            |
| duue_3113 | $(d_3Cu_1)(u_1Ce_3)$                               | C            |
| duue_3121 | $(d_3Cu_1)(u_2Ce_1)$                               | C            |
| duue_3122 | $\left(d_3Cu_1\right)\left(u_2Ce_2\right)$         | $\mathbf{C}$ |

| WC name   | Operator                                   | Type            |
|-----------|--|-----------------|
| duue_3123 | $(d_3Cu_1)(u_2Ce_3)$                       | C               |
| duue_3131 | $(d_3Cu_1)(u_3Ce_1)$                       | C               |
| duue_3132 | $(d_3Cu_1)(u_3Ce_2)$                       | C               |
| duue_3133 | $\left(d_3Cu_1\right)\left(u_3Ce_3\right)$ | $^{\mathrm{C}}$ |
| duue_3211 | $(d_3Cu_2)(u_1Ce_1)$                       | $\mathbf{C}$    |
| duue_3212 | $(d_3Cu_2)(u_1Ce_2)$                       | $\mathbf{C}$    |
| duue_3213 | $(d_3Cu_2)(u_1Ce_3)$                       | $\mathbf{C}$    |
| duue_3221 | $(d_3Cu_2)(u_2Ce_1)$                       | $\mathbf{C}$    |
| duue_3222 | $(d_3Cu_2)(u_2Ce_2)$                       | $\mathbf{C}$    |
| duue_3223 | $(d_3Cu_2)(u_2Ce_3)$                       | $\mathbf{C}$    |
| duue_3231 | $(d_3Cu_2)(u_3Ce_1)$                       | $^{\mathrm{C}}$ |
| duue_3232 | $(d_3Cu_2)(u_3Ce_2)$                       | C               |
| duue_3233 | $(d_3Cu_2)(u_3Ce_3)$                       | $\mathbf{C}$    |
| duue_3311 | $(d_3Cu_3)(u_1Ce_1)$                       | $\mathbf{C}$    |
| duue_3312 | $(d_3Cu_3)(u_1Ce_2)$                       | $\mathbf{C}$    |
| duue_3313 | $(d_3Cu_3)(u_1Ce_3)$                       | $\mathbf{C}$    |
| duue_3321 | $(d_3Cu_3)(u_2Ce_1)$                       | C               |
| duue_3322 | $(d_3Cu_3)(u_2Ce_2)$                       | C               |
| duue_3323 | $(d_3Cu_3)(u_2Ce_3)$                       | C               |
| duue_3331 | $(d_3Cu_3)(u_3Ce_1)$                       | C               |
| duue_3332 | $(d_3Cu_3)(u_3Ce_2)$                       | C               |
| duue_3333 | $(d_3Cu_3)(u_3Ce_3)$                       | C               |

## dL=2

| WC name     | Operator  | Type            |
|-------------|---|-----------------|
| llphiphi_11 | $\left(\widetilde{\varphi}^{\dagger}\ell_{1}\right)^{T}C\left(\widetilde{\varphi}^{\dagger}\ell_{1}\right)$ | C               |
| llphiphi_12 | $\left(\widetilde{arphi}^{\dagger}\ell_{1} ight)^{T}C\left(\widetilde{arphi}^{\dagger}\ell_{2} ight)$       | $\mathbf{C}$    |
| llphiphi_13 | $\left(\widetilde{\varphi}^{\dagger}\ell_{1}\right)^{T}C\left(\widetilde{\varphi}^{\dagger}\ell_{3}\right)$ | $\mathbf{C}$    |
| llphiphi_22 | $\left(\widetilde{arphi}^{\dagger}\ell_{2}\right)^{T}C\left(\widetilde{arphi}^{\dagger}\ell_{2}\right)$     | $\mathbf{C}$    |
| llphiphi_23 | $\left(\widetilde{arphi}^{\dagger}\ell_{2}\right)^{T}C\left(\widetilde{arphi}^{\dagger}\ell_{3}\right)$     | $\mathbf{C}$    |
| llphiphi_33 | $(\widetilde{\varphi}^{\dagger}\ell_3)^T C (\widetilde{\varphi}^{\dagger}\ell_3)$                           | $^{\mathrm{C}}$ |