**coil\_features**

|  |  |
| --- | --- |
| name | shape |
| coilfeatures\_v7\_2.npy | (15700, 369) |
| coilfeatures\_v7\_3.npy | (99800, 369) |
| coilfeatures\_v7\_4.npy | (236800, 369) |
| coilfeatures\_v7\_5.npy | (261200, 369) |
| coilfeatures\_v7\_6.npy | (255900, 369) |
| coilfeatures\_v5\_1.npy | (100000, 369) |
| coilfeatures\_v5\_2.npy | (100000, 369) |
| coilfeatures\_v5\_3.npy | (100000, 369) |
| coilfeatures\_v5\_4.npy | (100000, 369) |
| coilfeatures\_v5\_5.npy | (100000, 369) |
| coilfeatures\_v5\_6.npy | (100000, 369) |
| coilfeatures\_v5\_7.npy | (100000, 369) |
| coilfeatures\_v5\_8.npy | (100000, 369) |
| coilfeatures\_v5\_9.npy | (100000, 369) |
| features\_COIL\_4892-109.npy | (100, 371) |
| coilfeatures\_RM\_v1\_QRT\_1.npy | (925600, 8) |
| coilfeatures\_RM\_v1\_QRT\_2.npy | (102300, 8) |
| coilfeatures\_RM\_v1\_QRT\_3.npy | (44700, 8) |
| coilfeatures\_RM\_v1\_QRT\_4.npy | (147800, 8) |
| coilfeatures\_RM\_v1\_QRT\_5.npy | (800, 8) |
| coilfeatures\_RM\_v1\_QRT\_6.npy | (163000, 8) |

-The first and second dimensions of input data (i.e., sample number) have a variable size.

-What do the QRT and RM stand for?

**coil\_target**

|  |  |
| --- | --- |
| name | shape |
| coiltargets\_v7\_2.npy | (15700, 11) |
| coiltargets\_v7\_3.npy | (99800, 11) |
| coiltargets\_v7\_4.npy | (236800, 11) |
| coiltargets\_v7\_6.npy | (255900, 11) |
| 2017coiltargets\_RM\_v8\_QRT\_1.npy | (724100, 11) |
|  |  |

-All target categories are 11, while most of the model output is 1 dimension only.

**Target\_label**

|  |  |  |
| --- | --- | --- |
| name | shape | value |
| 2017targetlabels\_RM\_QRT\_v8.npy | (11,1) | array([b'AFDW', b'BLRND', b'OHV', b'OXOVR', b'OXSLB', b'TIGST', b'WALSV',  b'LUS', b'AFDW6', b'AFDW7', b'STNGW'], dtype='|S5') |
| targetlabels\_RM\_QRT\_v1.npy | (11,1) | array(['AFDW', 'BLRND', 'OHV', 'OXOVR', 'OXSLB', 'TIGST', 'WALSV', 'LUS',  'AFDW6', 'AFDW7', 'STNGW'],  dtype='|S5') |
| targetlabels\_RM\_v1.npy | (11,1) | array(['AFDW', 'BLRND', 'OHV', 'OXOVR', 'OXSLB', 'TIGST', 'WALSV', 'LUS',  'AFDW6', 'AFDW7', 'STNGW'],  dtype='|S5') |
| targetlabels\_v7.npy | (11,1) | array([b'AFDW', b'BLRND', b'OHV', b'OXOVR', b'OXSLB', b'TIGST', b'WALSV',  b'LUS', b'AFDW6', b'AFDW7', b'STNGW'], dtype='|S5') |
|  |  |  |

**Feature\_label**

|  |  |  |  |
| --- | --- | --- | --- |
| featurelabels\_v7.npy | size | featurelabels\_real.npy | size |
| array([b'RelPos', b'PARAM\_SET\_BOTTOM\_SIDE', b'THEO\_LENGTH', b'THEO\_WIDTH',  b'MEASURED\_LENGTH-THEO', b'MEASURED\_WIDTH-THEO', b'MEASURED\_SPEED',  b'std\_FM1\_F1\_7-62-a', b'mean\_FM1\_F1\_7-62-a', b'std\_FM1\_F1\_7-63-a',  b'mean\_FM1\_F1\_7-63-a', b'std\_FM1\_F1\_7-2-a', b'mean\_FM1\_F1\_7-2-a',  b'std\_FM1\_F1\_15-60-a', b'mean\_FM1\_F1\_15-60-a',  b'std\_FM1\_F1\_15-44-a', b'mean\_FM1\_F1\_15-44-a',  b'std\_FM1\_F1\_16-8-a', b'mean\_FM1\_F1\_16-8-a', b'std\_FM1\_F1\_16-9-a',  b'mean\_FM1\_F1\_16-9-a', b'std\_FM1\_F1\_23-45-a',  b'mean\_FM1\_F1\_23-45-a', b'std\_FM1\_F1\_24-1-a',  b'mean\_FM1\_F1\_24-1-a', b'std\_FM1\_F1\_28-21-a',  b'mean\_FM1\_F1\_28-21-a', b'std\_FM1\_F1\_28-28-a',  b'mean\_FM1\_F1\_28-28-a', b'std\_FM1\_F1\_28-35-a',  b'mean\_FM1\_F1\_28-35-a', b'std\_FM1\_F1\_29-0-a',  b'mean\_FM1\_F1\_29-0-a', b'std\_FM1\_F1\_29-1-a', b'mean\_FM1\_F1\_29-1-a',  b'std\_FM1\_F2\_8-62-a', b'mean\_FM1\_F2\_8-62-a', b'std\_FM1\_F2\_8-63-a',  b'mean\_FM1\_F2\_8-63-a', b'std\_FM1\_F2\_8-2-a', b'mean\_FM1\_F2\_8-2-a',  b'std\_FM1\_F2\_15-61-a', b'mean\_FM1\_F2\_15-61-a',  b'std\_FM1\_F2\_15-47-a', b'mean\_FM1\_F2\_15-47-a',  b'std\_FM1\_F2\_17-8-a', b'mean\_FM1\_F2\_17-8-a', b'std\_FM1\_F2\_17-9-a',  b'mean\_FM1\_F2\_17-9-a', b'std\_FM1\_F2\_23-46-a',  b'mean\_FM1\_F2\_23-46-a', b'std\_FM1\_F2\_24-2-a',  b'mean\_FM1\_F2\_24-2-a', b'std\_FM1\_F2\_28-22-a',  b'mean\_FM1\_F2\_28-22-a', b'std\_FM1\_F2\_28-29-a',  b'mean\_FM1\_F2\_28-29-a', b'std\_FM1\_F2\_28-36-a',  b'mean\_FM1\_F2\_28-36-a', b'std\_FM1\_F2\_29-2-a',  b'mean\_FM1\_F2\_29-2-a', b'std\_FM1\_F2\_29-3-a', b'mean\_FM1\_F2\_29-3-a',  b'std\_FM1\_F3\_9-62-a', b'mean\_FM1\_F3\_9-62-a', b'std\_FM1\_F3\_9-63-a',  b'mean\_FM1\_F3\_9-63-a', b'std\_FM1\_F3\_9-2-a', b'mean\_FM1\_F3\_9-2-a',  b'std\_FM1\_F3\_15-62-a', b'mean\_FM1\_F3\_15-62-a',  b'std\_FM1\_F3\_15-50-a', b'mean\_FM1\_F3\_15-50-a',  b'std\_FM1\_F3\_18-8-a', b'mean\_FM1\_F3\_18-8-a', b'std\_FM1\_F3\_18-9-a',  b'mean\_FM1\_F3\_18-9-a', b'std\_FM1\_F3\_23-47-a',  b'mean\_FM1\_F3\_23-47-a', b'std\_FM1\_F3\_24-3-a',  b'mean\_FM1\_F3\_24-3-a', b'std\_FM1\_F3\_28-23-a',  b'mean\_FM1\_F3\_28-23-a', b'std\_FM1\_F3\_28-30-a',  b'mean\_FM1\_F3\_28-30-a', b'std\_FM1\_F3\_28-37-a',  b'mean\_FM1\_F3\_28-37-a', b'std\_FM1\_F3\_29-4-a',  b'mean\_FM1\_F3\_29-4-a', b'std\_FM1\_F3\_29-5-a', b'mean\_FM1\_F3\_29-5-a',  b'std\_FM1\_F4\_10-62-a', b'mean\_FM1\_F4\_10-62-a',  b'std\_FM1\_F4\_10-63-a', b'mean\_FM1\_F4\_10-63-a',  b'std\_FM1\_F4\_10-2-a', b'mean\_FM1\_F4\_10-2-a', b'std\_FM1\_F4\_15-63-a',  b'mean\_FM1\_F4\_15-63-a', b'std\_FM1\_F4\_15-53-a',  b'mean\_FM1\_F4\_15-53-a', b'std\_FM1\_F4\_19-8-a',  b'mean\_FM1\_F4\_19-8-a', b'std\_FM1\_F4\_19-9-a', b'mean\_FM1\_F4\_19-9-a',  b'std\_FM1\_F4\_23-48-a', b'mean\_FM1\_F4\_23-48-a',  b'std\_FM1\_F4\_25-0-a', b'mean\_FM1\_F4\_25-0-a', b'std\_FM1\_F4\_28-24-a',  b'mean\_FM1\_F4\_28-24-a', b'std\_FM1\_F4\_28-31-a',  b'mean\_FM1\_F4\_28-31-a', b'std\_FM1\_F4\_28-38-a',  b'mean\_FM1\_F4\_28-38-a', b'std\_FM1\_F4\_29-6-a',  b'mean\_FM1\_F4\_29-6-a', b'std\_FM1\_F4\_29-7-a', b'mean\_FM1\_F4\_29-7-a',  b'std\_FM1\_F5\_11-62-a', b'mean\_FM1\_F5\_11-62-a',  b'std\_FM1\_F5\_11-63-a', b'mean\_FM1\_F5\_11-63-a',  b'std\_FM1\_F5\_11-2-a', b'mean\_FM1\_F5\_11-2-a', b'std\_FM1\_F5\_15-64-a',  b'mean\_FM1\_F5\_15-64-a', b'std\_FM1\_F5\_15-56-a',  b'mean\_FM1\_F5\_15-56-a', b'std\_FM1\_F5\_20-8-a',  b'mean\_FM1\_F5\_20-8-a', b'std\_FM1\_F5\_20-9-a', b'mean\_FM1\_F5\_20-9-a',  b'std\_FM1\_F5\_23-49-a', b'mean\_FM1\_F5\_23-49-a',  b'std\_FM1\_F5\_25-1-a', b'mean\_FM1\_F5\_25-1-a', b'std\_FM1\_F5\_28-25-a',  b'mean\_FM1\_F5\_28-25-a', b'std\_FM1\_F5\_28-32-a',  b'mean\_FM1\_F5\_28-32-a', b'std\_FM1\_F5\_28-39-a',  b'mean\_FM1\_F5\_28-39-a', b'std\_FM1\_F6\_12-62-a',  b'mean\_FM1\_F6\_12-62-a', b'std\_FM1\_F6\_12-63-a',  b'mean\_FM1\_F6\_12-63-a', b'std\_FM1\_F6\_12-2-a',  b'mean\_FM1\_F6\_12-2-a', b'std\_FM1\_F6\_15-65-a',  b'mean\_FM1\_F6\_15-65-a', b'std\_FM1\_F6\_15-59-a',  b'mean\_FM1\_F6\_15-59-a', b'std\_FM1\_F6\_21-8-a',  b'mean\_FM1\_F6\_21-8-a', b'std\_FM1\_F6\_21-9-a', b'mean\_FM1\_F6\_21-9-a',  b'std\_FM1\_F6\_23-50-a', b'mean\_FM1\_F6\_23-50-a',  b'std\_FM1\_F6\_25-2-a', b'mean\_FM1\_F6\_25-2-a', b'std\_FM1\_F6\_28-26-a',  b'mean\_FM1\_F6\_28-26-a', b'std\_FM1\_F6\_28-33-a',  b'mean\_FM1\_F6\_28-33-a', b'std\_FM1\_F6\_28-40-a',  b'mean\_FM1\_F6\_28-40-a', b'std\_FM1\_F7\_13-62-a',  b'mean\_FM1\_F7\_13-62-a', b'std\_FM1\_F7\_13-63-a',  b'mean\_FM1\_F7\_13-63-a', b'std\_FM1\_F7\_13-2-a',  b'mean\_FM1\_F7\_13-2-a', b'std\_FM1\_F7\_22-8-a', b'mean\_FM1\_F7\_22-8-a',  b'std\_FM1\_F7\_22-9-a', b'mean\_FM1\_F7\_22-9-a', b'std\_FM1\_F7\_23-51-a',  b'mean\_FM1\_F7\_23-51-a', b'std\_FM1\_F7\_25-3-a',  b'mean\_FM1\_F7\_25-3-a', b'std\_FM1\_F7\_28-27-a',  b'mean\_FM1\_F7\_28-27-a', b'std\_FM1\_F7\_28-34-a',  b'mean\_FM1\_F7\_28-34-a', b'std\_FM1\_F7\_28-41-a',  b'mean\_FM1\_F7\_28-41-a', b'std\_FM2\_F1\_1-5-a', b'mean\_FM2\_F1\_1-5-a',  b'std\_FM2\_F1\_1-36-a', b'mean\_FM2\_F1\_1-36-a', b'std\_FM2\_F1\_6-3-d',  b'mean\_FM2\_F1\_6-3-d', b'std\_FM2\_F1\_6-4-d', b'mean\_FM2\_F1\_6-4-d',  b'std\_FM2\_F1\_6-5-d', b'mean\_FM2\_F1\_6-5-d', b'std\_FM2\_F1\_27-0-a',  b'mean\_FM2\_F1\_27-0-a', b'std\_FM2\_F1\_27-1-a', b'mean\_FM2\_F1\_27-1-a',  b'std\_FM2\_F1\_31-4-a', b'mean\_FM2\_F1\_31-4-a', b'std\_FM2\_F1\_31-1-a',  b'mean\_FM2\_F1\_31-1-a', b'std\_FM2\_F1\_31-29-a',  b'mean\_FM2\_F1\_31-29-a', b'std\_FM2\_F1\_31-2-a',  b'mean\_FM2\_F1\_31-2-a', b'std\_FM2\_F1\_31-6-a', b'mean\_FM2\_F1\_31-6-a',  b'std\_FM2\_F1\_31-7-a', b'mean\_FM2\_F1\_31-7-a', b'std\_FM2\_F2\_1-6-a',  b'mean\_FM2\_F2\_1-6-a', b'std\_FM2\_F2\_1-36-a', b'mean\_FM2\_F2\_1-36-a',  b'std\_FM2\_F2\_6-3-d', b'mean\_FM2\_F2\_6-3-d', b'std\_FM2\_F2\_6-4-d',  b'mean\_FM2\_F2\_6-4-d', b'std\_FM2\_F2\_6-5-d', b'mean\_FM2\_F2\_6-5-d',  b'std\_FM2\_F2\_27-0-a', b'mean\_FM2\_F2\_27-0-a', b'std\_FM2\_F2\_27-1-a',  b'mean\_FM2\_F2\_27-1-a', b'std\_FM2\_F2\_31-4-a', b'mean\_FM2\_F2\_31-4-a',  b'std\_FM2\_F2\_31-1-a', b'mean\_FM2\_F2\_31-1-a', b'std\_FM2\_F2\_31-29-a',  b'mean\_FM2\_F2\_31-29-a', b'std\_FM2\_F2\_31-2-a',  b'mean\_FM2\_F2\_31-2-a', b'std\_FM2\_F2\_31-6-a', b'mean\_FM2\_F2\_31-6-a',  b'std\_FM2\_F2\_31-7-a', b'mean\_FM2\_F2\_31-7-a', b'std\_FM2\_F3\_1-7-a',  b'mean\_FM2\_F3\_1-7-a', b'std\_FM2\_F3\_1-36-a', b'mean\_FM2\_F3\_1-36-a',  b'std\_FM2\_F3\_6-3-d', b'mean\_FM2\_F3\_6-3-d', b'std\_FM2\_F3\_6-4-d',  b'mean\_FM2\_F3\_6-4-d', b'std\_FM2\_F3\_6-5-d', b'mean\_FM2\_F3\_6-5-d',  b'std\_FM2\_F3\_27-0-a', b'mean\_FM2\_F3\_27-0-a', b'std\_FM2\_F3\_27-1-a',  b'mean\_FM2\_F3\_27-1-a', b'std\_FM2\_F3\_31-4-a', b'mean\_FM2\_F3\_31-4-a',  b'std\_FM2\_F3\_31-1-a', b'mean\_FM2\_F3\_31-1-a', b'std\_FM2\_F3\_31-29-a',  b'mean\_FM2\_F3\_31-29-a', b'std\_FM2\_F3\_31-2-a',  b'mean\_FM2\_F3\_31-2-a', b'std\_FM2\_F3\_31-6-a', b'mean\_FM2\_F3\_31-6-a',  b'std\_FM2\_F3\_31-7-a', b'mean\_FM2\_F3\_31-7-a', b'std\_FM2\_F4\_1-8-a',  b'mean\_FM2\_F4\_1-8-a', b'std\_FM2\_F4\_1-36-a', b'mean\_FM2\_F4\_1-36-a',  b'std\_FM2\_F4\_6-3-d', b'mean\_FM2\_F4\_6-3-d', b'std\_FM2\_F4\_6-4-d',  b'mean\_FM2\_F4\_6-4-d', b'std\_FM2\_F4\_6-5-d', b'mean\_FM2\_F4\_6-5-d',  b'std\_FM2\_F4\_27-0-a', b'mean\_FM2\_F4\_27-0-a', b'std\_FM2\_F4\_27-1-a',  b'mean\_FM2\_F4\_27-1-a', b'std\_FM2\_F4\_31-4-a', b'mean\_FM2\_F4\_31-4-a',  b'std\_FM2\_F4\_31-1-a', b'mean\_FM2\_F4\_31-1-a', b'std\_FM2\_F4\_31-29-a',  b'mean\_FM2\_F4\_31-29-a', b'std\_FM2\_F4\_31-2-a',  b'mean\_FM2\_F4\_31-2-a', b'std\_FM2\_F4\_31-6-a', b'mean\_FM2\_F4\_31-6-a',  b'std\_FM2\_F4\_31-7-a', b'mean\_FM2\_F4\_31-7-a', b'std\_FM2\_F5\_1-9-a',  b'mean\_FM2\_F5\_1-9-a', b'std\_FM2\_F5\_1-36-a', b'mean\_FM2\_F5\_1-36-a',  b'std\_FM2\_F5\_6-3-d', b'mean\_FM2\_F5\_6-3-d', b'std\_FM2\_F5\_6-4-d',  b'mean\_FM2\_F5\_6-4-d', b'std\_FM2\_F5\_6-5-d', b'mean\_FM2\_F5\_6-5-d',  b'std\_FM2\_F5\_27-0-a', b'mean\_FM2\_F5\_27-0-a', b'std\_FM2\_F5\_27-1-a',  b'mean\_FM2\_F5\_27-1-a', b'std\_FM2\_F5\_31-4-a', b'mean\_FM2\_F5\_31-4-a',  b'std\_FM2\_F5\_31-1-a', b'mean\_FM2\_F5\_31-1-a', b'std\_FM2\_F5\_31-29-a',  b'mean\_FM2\_F5\_31-29-a', b'std\_FM2\_F5\_31-2-a',  b'mean\_FM2\_F5\_31-2-a', b'std\_FM2\_F5\_31-6-a', b'mean\_FM2\_F5\_31-6-a',  b'std\_FM2\_F5\_31-7-a', b'mean\_FM2\_F5\_31-7-a', b'std\_FM2\_F6\_1-10-a',  b'mean\_FM2\_F6\_1-10-a', b'std\_FM2\_F6\_1-36-a', b'mean\_FM2\_F6\_1-36-a',  b'std\_FM2\_F6\_6-3-d', b'mean\_FM2\_F6\_6-3-d', b'std\_FM2\_F6\_6-4-d',  b'mean\_FM2\_F6\_6-4-d', b'std\_FM2\_F6\_6-5-d', b'mean\_FM2\_F6\_6-5-d',  b'std\_FM2\_F6\_27-0-a', b'mean\_FM2\_F6\_27-0-a', b'std\_FM2\_F6\_27-1-a',  b'mean\_FM2\_F6\_27-1-a', b'std\_FM2\_F6\_31-4-a', b'mean\_FM2\_F6\_31-4-a',  b'std\_FM2\_F6\_31-1-a', b'mean\_FM2\_F6\_31-1-a', b'std\_FM2\_F6\_31-29-a',  b'mean\_FM2\_F6\_31-29-a', b'std\_FM2\_F6\_31-2-a',  b'mean\_FM2\_F6\_31-2-a', b'std\_FM2\_F6\_31-6-a', b'mean\_FM2\_F6\_31-6-a',  b'std\_FM2\_F6\_31-7-a', b'mean\_FM2\_F6\_31-7-a', b'std\_FM2\_F7\_1-11-a',  b'mean\_FM2\_F7\_1-11-a', b'std\_FM2\_F7\_1-36-a', b'mean\_FM2\_F7\_1-36-a',  b'std\_FM2\_F7\_6-3-d', b'mean\_FM2\_F7\_6-3-d', b'std\_FM2\_F7\_6-4-d',  b'mean\_FM2\_F7\_6-4-d', b'std\_FM2\_F7\_6-5-d', b'mean\_FM2\_F7\_6-5-d',  b'std\_FM2\_F7\_27-0-a', b'mean\_FM2\_F7\_27-0-a', b'std\_FM2\_F7\_27-1-a',  b'mean\_FM2\_F7\_27-1-a', b'std\_FM2\_F7\_31-4-a', b'mean\_FM2\_F7\_31-4-a',  b'std\_FM2\_F7\_31-1-a', b'mean\_FM2\_F7\_31-1-a', b'std\_FM2\_F7\_31-29-a',  b'mean\_FM2\_F7\_31-29-a', b'std\_FM2\_F7\_31-2-a',  b'mean\_FM2\_F7\_31-2-a', b'std\_FM2\_F7\_31-6-a', b'mean\_FM2\_F7\_31-6-a',  b'std\_FM2\_F7\_31-7-a', b'mean\_FM2\_F7\_31-7-a'], dtype='|S21') | 369 | {'mean\_FM1\_F1\_15-44-a': 'FM1\_F1LA\_FM\_F1\_LOOP: Spec. tension actual value from loadcell calculation',  'mean\_FM1\_F1\_15-60-a': 'FM1\_F1LA\_FM\_F1\_LOOP: Actual looper angle',  'mean\_FM1\_F1\_16-8-a': 'FM1\_F1LA\_FM\_F1\_RBS: Actual Bending In Force',  'mean\_FM1\_F1\_16-9-a': 'FM1\_F1LA\_FM\_F1\_RBS: Actual Bending Out Force',  'mean\_FM1\_F1\_23-45-a': 'FM1\_F1LA\_FM\_F1\_RCH: WR diameter',  'mean\_FM1\_F1\_24-1-a': 'FM1\_F1LA\_FM\_F1\_SG: Actual position',  'mean\_FM1\_F1\_28-21-a': 'FM1\_F1LA\_FM\_F1\_WRC: base actual pressure',  'mean\_FM1\_F1\_28-28-a': 'FM1\_F1LA\_FM\_F1\_WRC: wide actual pressure',  'mean\_FM1\_F1\_28-35-a': 'FM1\_F1LA\_FM\_F1\_WRC: narrow actual pressure',  'mean\_FM1\_F1\_29-0-a': 'FM1\_F1LA\_FM\_F1\_ISC: Flow water curtain upper F1-2',  'mean\_FM1\_F1\_29-1-a': 'FM1\_F1LA\_FM\_F1\_ISC: Flow water curtain lower F1-2',  'mean\_FM1\_F1\_7-2-a': 'FM1\_F1LA\_FM\_F1\_GAP: Actual gap position',  'mean\_FM1\_F1\_7-62-a': 'FM1\_F1LA\_FM\_F1\_GAP: Total Roll Force from AI LC',  'mean\_FM1\_F1\_7-63-a': 'FM1\_F1LA\_FM\_F1\_GAP: Difference Roll Force from AI LC',  'mean\_FM1\_F2\_15-47-a': 'FM1\_F2LA\_FM\_F2\_LOOP: Spec. tension actual value from loadcell calculation',  'mean\_FM1\_F2\_15-61-a': 'FM1\_F2LA\_FM\_F2\_LOOP: Actual looper angle',  'mean\_FM1\_F2\_17-8-a': 'FM1\_F2LA\_FM\_F2\_RBS: Actual Bending In Force',  'mean\_FM1\_F2\_17-9-a': 'FM1\_F2LA\_FM\_F2\_RBS: Actual Bending Out Force',  'mean\_FM1\_F2\_23-46-a': 'FM1\_F2LA\_FM\_F2\_RCH: WR diameter',  'mean\_FM1\_F2\_24-2-a': 'FM1\_F2LA\_FM\_F2\_SG: Actual position',  'mean\_FM1\_F2\_28-22-a': 'FM1\_F2LA\_FM\_F2\_WRC: base actual pressure',  'mean\_FM1\_F2\_28-29-a': 'FM1\_F2LA\_FM\_F2\_WRC: wide actual pressure',  'mean\_FM1\_F2\_28-36-a': 'FM1\_F2LA\_FM\_F2\_WRC: narrow actual pressure',  'mean\_FM1\_F2\_29-2-a': 'FM1\_F2LA\_FM\_F2\_ISC: Flow water curtain upper F2-3',  'mean\_FM1\_F2\_29-3-a': 'FM1\_F2LA\_FM\_F2\_ISC: Flow water curtain lower F2-3',  'mean\_FM1\_F2\_8-2-a': 'FM1\_F2LA\_FM\_F2\_GAP: Actual gap position',  'mean\_FM1\_F2\_8-62-a': 'FM1\_F2LA\_FM\_F2\_GAP: Total Roll Force from AI LC',  'mean\_FM1\_F2\_8-63-a': 'FM1\_F2LA\_FM\_F2\_GAP: Difference Roll Force from AI LC',  'mean\_FM1\_F3\_15-50-a': 'FM1\_F3LA\_FM\_F3\_LOOP: Spec. tension actual value from loadcell calculation',  'mean\_FM1\_F3\_15-62-a': 'FM1\_F3LA\_FM\_F3\_LOOP: Actual looper angle',  'mean\_FM1\_F3\_18-8-a': 'FM1\_F3LA\_FM\_F3\_RBS: Actual Bending In Force',  'mean\_FM1\_F3\_18-9-a': 'FM1\_F3LA\_FM\_F3\_RBS: Actual Bending Out Force',  'mean\_FM1\_F3\_23-47-a': 'FM1\_F3LA\_FM\_F3\_RCH: WR diameter',  'mean\_FM1\_F3\_24-3-a': 'FM1\_F3LA\_FM\_F3\_SG: Actual position',  'mean\_FM1\_F3\_28-23-a': 'FM1\_F3LA\_FM\_F3\_WRC: base actual pressure',  'mean\_FM1\_F3\_28-30-a': 'FM1\_F3LA\_FM\_F3\_WRC: wide actual pressure',  'mean\_FM1\_F3\_28-37-a': 'FM1\_F3LA\_FM\_F3\_WRC: narrow actual pressure',  'mean\_FM1\_F3\_29-4-a': 'FM1\_F3LA\_FM\_F3\_ISC: Flow water curtain upper F3-4',  'mean\_FM1\_F3\_29-5-a': 'FM1\_F3LA\_FM\_F3\_ISC: Flow water curtain lower F3-4',  'mean\_FM1\_F3\_9-2-a': 'FM1\_F3LA\_FM\_F3\_GAP: Actual gap position',  'mean\_FM1\_F3\_9-62-a': 'FM1\_F3LA\_FM\_F3\_GAP: Total Roll Force from AI LC',  'mean\_FM1\_F3\_9-63-a': 'FM1\_F3LA\_FM\_F3\_GAP: Difference Roll Force from AI LC',  'mean\_FM1\_F4\_10-2-a': 'FM1\_F4LA\_FM\_F4\_GAP: Actual gap position',  'mean\_FM1\_F4\_10-62-a': 'FM1\_F4LA\_FM\_F4\_GAP: Total Roll Force from AI LC',  'mean\_FM1\_F4\_10-63-a': 'FM1\_F4LA\_FM\_F4\_GAP: Difference Roll Force from AI LC',  'mean\_FM1\_F4\_15-53-a': 'FM1\_F4LA\_FM\_F4\_LOOP: Spec. tension actual value from loadcell calculation',  'mean\_FM1\_F4\_15-63-a': 'FM1\_F4LA\_FM\_F4\_LOOP: Actual looper angle',  'mean\_FM1\_F4\_19-8-a': 'FM1\_F4LA\_FM\_F4\_RBS: Actual Bending In Force',  'mean\_FM1\_F4\_19-9-a': 'FM1\_F4LA\_FM\_F4\_RBS: Actual Bending Out Force',  'mean\_FM1\_F4\_23-48-a': 'FM1\_F4LA\_FM\_F4\_RCH: WR diameter',  'mean\_FM1\_F4\_25-0-a': 'FM1\_F4LA\_FM\_F4\_SG: Actual position',  'mean\_FM1\_F4\_28-24-a': 'FM1\_F4LA\_FM\_F4\_WRC: base actual pressure',  'mean\_FM1\_F4\_28-31-a': 'FM1\_F4LA\_FM\_F4\_WRC: wide actual pressure',  'mean\_FM1\_F4\_28-38-a': 'FM1\_F4LA\_FM\_F4\_WRC: narrow actual pressure',  'mean\_FM1\_F4\_29-6-a': 'FM1\_F4LA\_FM\_F4\_ISC: Flow water curtain upper F4-5',  'mean\_FM1\_F4\_29-7-a': 'FM1\_F4LA\_FM\_F4\_ISC: Flow water curtain lower F4-5',  'mean\_FM1\_F5\_11-2-a': 'FM1\_F5LA\_FM\_F5\_GAP: Actual gap position',  'mean\_FM1\_F5\_11-62-a': 'FM1\_F5LA\_FM\_F5\_GAP: Total Roll Force from AI LC',  'mean\_FM1\_F5\_11-63-a': 'FM1\_F5LA\_FM\_F5\_GAP: Difference Roll Force from AI LC',  'mean\_FM1\_F5\_15-56-a': 'FM1\_F5LA\_FM\_F5\_LOOP: Spec. tension actual value from loadcell calculation',  'mean\_FM1\_F5\_15-64-a': 'FM1\_F5LA\_FM\_F5\_LOOP: Actual looper angle',  'mean\_FM1\_F5\_20-8-a': 'FM1\_F5LA\_FM\_F5\_RBS: Actual Bending In Force',  'mean\_FM1\_F5\_20-9-a': 'FM1\_F5LA\_FM\_F5\_RBS: Actual Bending Out Force',  'mean\_FM1\_F5\_23-49-a': 'FM1\_F5LA\_FM\_F5\_RCH: WR diameter',  'mean\_FM1\_F5\_25-1-a': 'FM1\_F5LA\_FM\_F5\_SG: Actual position',  'mean\_FM1\_F5\_28-25-a': 'FM1\_F5LA\_FM\_F5\_WRC: base actual pressure',  'mean\_FM1\_F5\_28-32-a': 'FM1\_F5LA\_FM\_F5\_WRC: wide actual pressure',  'mean\_FM1\_F5\_28-39-a': 'FM1\_F5LA\_FM\_F5\_WRC: narrow actual pressure',  'mean\_FM1\_F6\_12-2-a': 'FM1\_F6LA\_FM\_F6\_GAP: Actual gap position',  'mean\_FM1\_F6\_12-62-a': 'FM1\_F6LA\_FM\_F6\_GAP: Total Roll Force from AI LC',  'mean\_FM1\_F6\_12-63-a': 'FM1\_F6LA\_FM\_F6\_GAP: Difference Roll Force from AI LC',  'mean\_FM1\_F6\_15-59-a': 'FM1\_F6LA\_FM\_F6\_LOOP: Spec. tension actual value from loadcell calculation',  'mean\_FM1\_F6\_15-65-a': 'FM1\_F6LA\_FM\_F6\_LOOP: Actual looper angle',  'mean\_FM1\_F6\_21-8-a': 'FM1\_F6LA\_FM\_F6\_RBS: Actual Bending In Force',  'mean\_FM1\_F6\_21-9-a': 'FM1\_F6LA\_FM\_F6\_RBS: Actual Bending Out Force',  'mean\_FM1\_F6\_23-50-a': 'FM1\_F6LA\_FM\_F6\_RCH: WR diameter',  'mean\_FM1\_F6\_25-2-a': 'FM1\_F6LA\_FM\_F6\_SG: Actual position',  'mean\_FM1\_F6\_28-26-a': 'FM1\_F6LA\_FM\_F6\_WRC: base actual pressure',  'mean\_FM1\_F6\_28-33-a': 'FM1\_F6LA\_FM\_F6\_WRC: wide actual pressure',  'mean\_FM1\_F6\_28-40-a': 'FM1\_F6LA\_FM\_F6\_WRC: narrow actual pressure',  'mean\_FM1\_F7\_13-2-a': 'FM1\_F7LA\_FM\_F7\_GAP: Actual gap position',  'mean\_FM1\_F7\_13-62-a': 'FM1\_F7LA\_FM\_F7\_GAP: Total Roll Force from AI LC',  'mean\_FM1\_F7\_13-63-a': 'FM1\_F7LA\_FM\_F7\_GAP: Difference Roll Force from AI LC',  'mean\_FM1\_F7\_22-8-a': 'FM1\_F7LA\_FM\_F7\_RBS: Actual Bending In Force',  'mean\_FM1\_F7\_22-9-a': 'FM1\_F7LA\_FM\_F7\_RBS: Actual Bending Out Force',  'mean\_FM1\_F7\_23-51-a': 'FM1\_F7LA\_FM\_F7\_RCH: WR diameter',  'mean\_FM1\_F7\_25-3-a': 'FM1\_F7LA\_FM\_F7\_SG: Actual position',  'mean\_FM1\_F7\_28-27-a': 'FM1\_F7LA\_FM\_F7\_WRC: base actual pressure',  'mean\_FM1\_F7\_28-34-a': 'FM1\_F7LA\_FM\_F7\_WRC: wide actual pressure',  'mean\_FM1\_F7\_28-41-a': 'FM1\_F7LA\_FM\_F7\_WRC: narrow actual pressure',  'mean\_FM2\_F1\_1-36-a': 'FM2\_F1LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'mean\_FM2\_F1\_1-5-a': 'FM2\_F1LA\_FM\_F1\_MD: Speed reference',  'mean\_FM2\_F1\_27-0-a': 'FM2\_F1EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'mean\_FM2\_F1\_27-1-a': 'FM2\_F1EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'mean\_FM2\_F1\_31-1-a': 'FM2\_F1LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'mean\_FM2\_F1\_31-2-a': 'FM2\_F1LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'mean\_FM2\_F1\_31-29-a': 'FM2\_F1LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'mean\_FM2\_F1\_31-4-a': 'FM2\_F1LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'mean\_FM2\_F1\_31-6-a': 'FM2\_F1LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'mean\_FM2\_F1\_31-7-a': 'FM2\_F1LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'mean\_FM2\_F1\_6-3-d': 'FM2\_F1ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'mean\_FM2\_F1\_6-4-d': 'FM2\_F1ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'mean\_FM2\_F1\_6-5-d': 'FM2\_F1ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'mean\_FM2\_F2\_1-36-a': 'FM2\_F2LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'mean\_FM2\_F2\_1-6-a': 'FM2\_F2LA\_FM\_F2\_MD: Speed reference',  'mean\_FM2\_F2\_27-0-a': 'FM2\_F2EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'mean\_FM2\_F2\_27-1-a': 'FM2\_F2EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'mean\_FM2\_F2\_31-1-a': 'FM2\_F2LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'mean\_FM2\_F2\_31-2-a': 'FM2\_F2LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'mean\_FM2\_F2\_31-29-a': 'FM2\_F2LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'mean\_FM2\_F2\_31-4-a': 'FM2\_F2LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'mean\_FM2\_F2\_31-6-a': 'FM2\_F2LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'mean\_FM2\_F2\_31-7-a': 'FM2\_F2LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'mean\_FM2\_F2\_6-3-d': 'FM2\_F2ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'mean\_FM2\_F2\_6-4-d': 'FM2\_F2ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'mean\_FM2\_F2\_6-5-d': 'FM2\_F2ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'mean\_FM2\_F3\_1-36-a': 'FM2\_F3LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'mean\_FM2\_F3\_1-7-a': 'FM2\_F3LA\_FM\_F3\_MD: Speed reference',  'mean\_FM2\_F3\_27-0-a': 'FM2\_F3EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'mean\_FM2\_F3\_27-1-a': 'FM2\_F3EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'mean\_FM2\_F3\_31-1-a': 'FM2\_F3LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'mean\_FM2\_F3\_31-2-a': 'FM2\_F3LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'mean\_FM2\_F3\_31-29-a': 'FM2\_F3LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'mean\_FM2\_F3\_31-4-a': 'FM2\_F3LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'mean\_FM2\_F3\_31-6-a': 'FM2\_F3LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'mean\_FM2\_F3\_31-7-a': 'FM2\_F3LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'mean\_FM2\_F3\_6-3-d': 'FM2\_F3ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'mean\_FM2\_F3\_6-4-d': 'FM2\_F3ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'mean\_FM2\_F3\_6-5-d': 'FM2\_F3ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'mean\_FM2\_F4\_1-36-a': 'FM2\_F4LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'mean\_FM2\_F4\_1-8-a': 'FM2\_F4LA\_FM\_F4\_MD: Speed reference',  'mean\_FM2\_F4\_27-0-a': 'FM2\_F4EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'mean\_FM2\_F4\_27-1-a': 'FM2\_F4EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'mean\_FM2\_F4\_31-1-a': 'FM2\_F4LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'mean\_FM2\_F4\_31-2-a': 'FM2\_F4LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'mean\_FM2\_F4\_31-29-a': 'FM2\_F4LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'mean\_FM2\_F4\_31-4-a': 'FM2\_F4LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'mean\_FM2\_F4\_31-6-a': 'FM2\_F4LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'mean\_FM2\_F4\_31-7-a': 'FM2\_F4LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'mean\_FM2\_F4\_6-3-d': 'FM2\_F4ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'mean\_FM2\_F4\_6-4-d': 'FM2\_F4ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'mean\_FM2\_F4\_6-5-d': 'FM2\_F4ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'mean\_FM2\_F5\_1-36-a': 'FM2\_F5LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'mean\_FM2\_F5\_1-9-a': 'FM2\_F5LA\_FM\_F5\_MD: Speed reference',  'mean\_FM2\_F5\_27-0-a': 'FM2\_F5EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'mean\_FM2\_F5\_27-1-a': 'FM2\_F5EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'mean\_FM2\_F5\_31-1-a': 'FM2\_F5LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'mean\_FM2\_F5\_31-2-a': 'FM2\_F5LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'mean\_FM2\_F5\_31-29-a': 'FM2\_F5LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'mean\_FM2\_F5\_31-4-a': 'FM2\_F5LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'mean\_FM2\_F5\_31-6-a': 'FM2\_F5LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'mean\_FM2\_F5\_31-7-a': 'FM2\_F5LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'mean\_FM2\_F5\_6-3-d': 'FM2\_F5ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'mean\_FM2\_F5\_6-4-d': 'FM2\_F5ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'mean\_FM2\_F5\_6-5-d': 'FM2\_F5ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'mean\_FM2\_F6\_1-10-a': 'FM2\_F6LA\_FM\_F6\_MD: Speed reference',  'mean\_FM2\_F6\_1-36-a': 'FM2\_F6LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'mean\_FM2\_F6\_27-0-a': 'FM2\_F6EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'mean\_FM2\_F6\_27-1-a': 'FM2\_F6EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'mean\_FM2\_F6\_31-1-a': 'FM2\_F6LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'mean\_FM2\_F6\_31-2-a': 'FM2\_F6LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'mean\_FM2\_F6\_31-29-a': 'FM2\_F6LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'mean\_FM2\_F6\_31-4-a': 'FM2\_F6LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'mean\_FM2\_F6\_31-6-a': 'FM2\_F6LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'mean\_FM2\_F6\_31-7-a': 'FM2\_F6LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'mean\_FM2\_F6\_6-3-d': 'FM2\_F6ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'mean\_FM2\_F6\_6-4-d': 'FM2\_F6ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'mean\_FM2\_F6\_6-5-d': 'FM2\_F6ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'mean\_FM2\_F7\_1-11-a': 'FM2\_F7LA\_FM\_F7\_MD: Speed reference',  'mean\_FM2\_F7\_1-36-a': 'FM2\_F7LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'mean\_FM2\_F7\_27-0-a': 'FM2\_F7EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'mean\_FM2\_F7\_27-1-a': 'FM2\_F7EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'mean\_FM2\_F7\_31-1-a': 'FM2\_F7LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'mean\_FM2\_F7\_31-2-a': 'FM2\_F7LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'mean\_FM2\_F7\_31-29-a': 'FM2\_F7LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'mean\_FM2\_F7\_31-4-a': 'FM2\_F7LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'mean\_FM2\_F7\_31-6-a': 'FM2\_F7LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'mean\_FM2\_F7\_31-7-a': 'FM2\_F7LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'mean\_FM2\_F7\_6-3-d': 'FM2\_F7ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'mean\_FM2\_F7\_6-4-d': 'FM2\_F7ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'mean\_FM2\_F7\_6-5-d': 'FM2\_F7ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'std\_FM1\_F1\_15-44-a': 'std FM1\_F1LA\_FM\_F1\_LOOP: Spec. tension actual value from loadcell calculation',  'std\_FM1\_F1\_15-60-a': 'std FM1\_F1LA\_FM\_F1\_LOOP: Actual looper angle',  'std\_FM1\_F1\_16-8-a': 'std FM1\_F1LA\_FM\_F1\_RBS: Actual Bending In Force',  'std\_FM1\_F1\_16-9-a': 'std FM1\_F1LA\_FM\_F1\_RBS: Actual Bending Out Force',  'std\_FM1\_F1\_23-45-a': 'std FM1\_F1LA\_FM\_F1\_RCH: WR diameter',  'std\_FM1\_F1\_24-1-a': 'std FM1\_F1LA\_FM\_F1\_SG: Actual position',  'std\_FM1\_F1\_28-21-a': 'std FM1\_F1LA\_FM\_F1\_WRC: base actual pressure',  'std\_FM1\_F1\_28-28-a': 'std FM1\_F1LA\_FM\_F1\_WRC: wide actual pressure',  'std\_FM1\_F1\_28-35-a': 'std FM1\_F1LA\_FM\_F1\_WRC: narrow actual pressure',  'std\_FM1\_F1\_29-0-a': 'std FM1\_F1LA\_FM\_F1\_ISC: Flow water curtain upper F1-2',  'std\_FM1\_F1\_29-1-a': 'std FM1\_F1LA\_FM\_F1\_ISC: Flow water curtain lower F1-2',  'std\_FM1\_F1\_7-2-a': 'std FM1\_F1LA\_FM\_F1\_GAP: Actual gap position',  'std\_FM1\_F1\_7-62-a': 'std FM1\_F1LA\_FM\_F1\_GAP: Total Roll Force from AI LC',  'std\_FM1\_F1\_7-63-a': 'std FM1\_F1LA\_FM\_F1\_GAP: Difference Roll Force from AI LC',  'std\_FM1\_F2\_15-47-a': 'std FM1\_F2LA\_FM\_F2\_LOOP: Spec. tension actual value from loadcell calculation',  'std\_FM1\_F2\_15-61-a': 'std FM1\_F2LA\_FM\_F2\_LOOP: Actual 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'std FM1\_F3LA\_FM\_F3\_LOOP: Spec. tension actual value from loadcell calculation',  'std\_FM1\_F3\_15-62-a': 'std FM1\_F3LA\_FM\_F3\_LOOP: Actual looper angle',  'std\_FM1\_F3\_18-8-a': 'std FM1\_F3LA\_FM\_F3\_RBS: Actual Bending In Force',  'std\_FM1\_F3\_18-9-a': 'std FM1\_F3LA\_FM\_F3\_RBS: Actual Bending Out Force',  'std\_FM1\_F3\_23-47-a': 'std FM1\_F3LA\_FM\_F3\_RCH: WR diameter',  'std\_FM1\_F3\_24-3-a': 'std FM1\_F3LA\_FM\_F3\_SG: Actual position',  'std\_FM1\_F3\_28-23-a': 'std FM1\_F3LA\_FM\_F3\_WRC: base actual pressure',  'std\_FM1\_F3\_28-30-a': 'std FM1\_F3LA\_FM\_F3\_WRC: wide actual pressure',  'std\_FM1\_F3\_28-37-a': 'std FM1\_F3LA\_FM\_F3\_WRC: narrow actual pressure',  'std\_FM1\_F3\_29-4-a': 'std FM1\_F3LA\_FM\_F3\_ISC: Flow water curtain upper F3-4',  'std\_FM1\_F3\_29-5-a': 'std FM1\_F3LA\_FM\_F3\_ISC: Flow water curtain lower F3-4',  'std\_FM1\_F3\_9-2-a': 'std FM1\_F3LA\_FM\_F3\_GAP: Actual gap position',  'std\_FM1\_F3\_9-62-a': 'std FM1\_F3LA\_FM\_F3\_GAP: Total Roll Force from AI LC',  'std\_FM1\_F3\_9-63-a': 'std FM1\_F3LA\_FM\_F3\_GAP: Difference Roll Force from AI LC',  'std\_FM1\_F4\_10-2-a': 'std FM1\_F4LA\_FM\_F4\_GAP: Actual gap position',  'std\_FM1\_F4\_10-62-a': 'std FM1\_F4LA\_FM\_F4\_GAP: Total Roll Force from AI LC',  'std\_FM1\_F4\_10-63-a': 'std FM1\_F4LA\_FM\_F4\_GAP: Difference Roll Force from AI LC',  'std\_FM1\_F4\_15-53-a': 'std FM1\_F4LA\_FM\_F4\_LOOP: Spec. tension actual value from loadcell calculation',  'std\_FM1\_F4\_15-63-a': 'std FM1\_F4LA\_FM\_F4\_LOOP: Actual looper angle',  'std\_FM1\_F4\_19-8-a': 'std FM1\_F4LA\_FM\_F4\_RBS: Actual Bending In Force',  'std\_FM1\_F4\_19-9-a': 'std FM1\_F4LA\_FM\_F4\_RBS: Actual Bending Out Force',  'std\_FM1\_F4\_23-48-a': 'std FM1\_F4LA\_FM\_F4\_RCH: WR diameter',  'std\_FM1\_F4\_25-0-a': 'std FM1\_F4LA\_FM\_F4\_SG: Actual position',  'std\_FM1\_F4\_28-24-a': 'std FM1\_F4LA\_FM\_F4\_WRC: base actual pressure',  'std\_FM1\_F4\_28-31-a': 'std FM1\_F4LA\_FM\_F4\_WRC: wide actual pressure',  'std\_FM1\_F4\_28-38-a': 'std FM1\_F4LA\_FM\_F4\_WRC: narrow actual pressure',  'std\_FM1\_F4\_29-6-a': 'std FM1\_F4LA\_FM\_F4\_ISC: Flow water curtain upper F4-5',  'std\_FM1\_F4\_29-7-a': 'std FM1\_F4LA\_FM\_F4\_ISC: Flow water curtain lower F4-5',  'std\_FM1\_F5\_11-2-a': 'std FM1\_F5LA\_FM\_F5\_GAP: Actual gap position',  'std\_FM1\_F5\_11-62-a': 'std FM1\_F5LA\_FM\_F5\_GAP: Total Roll Force from AI LC',  'std\_FM1\_F5\_11-63-a': 'std FM1\_F5LA\_FM\_F5\_GAP: Difference Roll Force from AI LC',  'std\_FM1\_F5\_15-56-a': 'std FM1\_F5LA\_FM\_F5\_LOOP: Spec. tension actual value from loadcell calculation',  'std\_FM1\_F5\_15-64-a': 'std FM1\_F5LA\_FM\_F5\_LOOP: Actual looper angle',  'std\_FM1\_F5\_20-8-a': 'std FM1\_F5LA\_FM\_F5\_RBS: Actual Bending In Force',  'std\_FM1\_F5\_20-9-a': 'std FM1\_F5LA\_FM\_F5\_RBS: Actual Bending Out Force',  'std\_FM1\_F5\_23-49-a': 'std FM1\_F5LA\_FM\_F5\_RCH: WR diameter',  'std\_FM1\_F5\_25-1-a': 'std FM1\_F5LA\_FM\_F5\_SG: Actual position',  'std\_FM1\_F5\_28-25-a': 'std FM1\_F5LA\_FM\_F5\_WRC: base actual pressure',  'std\_FM1\_F5\_28-32-a': 'std FM1\_F5LA\_FM\_F5\_WRC: wide actual pressure',  'std\_FM1\_F5\_28-39-a': 'std FM1\_F5LA\_FM\_F5\_WRC: narrow actual pressure',  'std\_FM1\_F6\_12-2-a': 'std FM1\_F6LA\_FM\_F6\_GAP: Actual gap position',  'std\_FM1\_F6\_12-62-a': 'std FM1\_F6LA\_FM\_F6\_GAP: Total Roll Force from AI LC',  'std\_FM1\_F6\_12-63-a': 'std FM1\_F6LA\_FM\_F6\_GAP: Difference Roll Force from AI LC',  'std\_FM1\_F6\_15-59-a': 'std FM1\_F6LA\_FM\_F6\_LOOP: Spec. tension actual value from loadcell calculation',  'std\_FM1\_F6\_15-65-a': 'std FM1\_F6LA\_FM\_F6\_LOOP: Actual looper angle',  'std\_FM1\_F6\_21-8-a': 'std FM1\_F6LA\_FM\_F6\_RBS: Actual Bending In Force',  'std\_FM1\_F6\_21-9-a': 'std FM1\_F6LA\_FM\_F6\_RBS: Actual Bending Out Force',  'std\_FM1\_F6\_23-50-a': 'std FM1\_F6LA\_FM\_F6\_RCH: WR diameter',  'std\_FM1\_F6\_25-2-a': 'std FM1\_F6LA\_FM\_F6\_SG: Actual position',  'std\_FM1\_F6\_28-26-a': 'std FM1\_F6LA\_FM\_F6\_WRC: base actual pressure',  'std\_FM1\_F6\_28-33-a': 'std FM1\_F6LA\_FM\_F6\_WRC: wide actual pressure',  'std\_FM1\_F6\_28-40-a': 'std FM1\_F6LA\_FM\_F6\_WRC: narrow actual pressure',  'std\_FM1\_F7\_13-2-a': 'std FM1\_F7LA\_FM\_F7\_GAP: Actual gap position',  'std\_FM1\_F7\_13-62-a': 'std FM1\_F7LA\_FM\_F7\_GAP: Total Roll Force from AI LC',  'std\_FM1\_F7\_13-63-a': 'std FM1\_F7LA\_FM\_F7\_GAP: Difference Roll Force from AI LC',  'std\_FM1\_F7\_22-8-a': 'std FM1\_F7LA\_FM\_F7\_RBS: Actual Bending In Force',  'std\_FM1\_F7\_22-9-a': 'std FM1\_F7LA\_FM\_F7\_RBS: Actual Bending Out Force',  'std\_FM1\_F7\_23-51-a': 'std FM1\_F7LA\_FM\_F7\_RCH: WR diameter',  'std\_FM1\_F7\_25-3-a': 'std FM1\_F7LA\_FM\_F7\_SG: Actual position',  'std\_FM1\_F7\_28-27-a': 'std FM1\_F7LA\_FM\_F7\_WRC: base actual pressure',  'std\_FM1\_F7\_28-34-a': 'std FM1\_F7LA\_FM\_F7\_WRC: wide actual pressure',  'std\_FM1\_F7\_28-41-a': 'std FM1\_F7LA\_FM\_F7\_WRC: narrow actual pressure',  'std\_FM2\_F1\_1-36-a': 'std FM2\_F1LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'std\_FM2\_F1\_1-5-a': 'std FM2\_F1LA\_FM\_F1\_MD: Speed reference',  'std\_FM2\_F1\_27-0-a': 'std FM2\_F1EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'std\_FM2\_F1\_27-1-a': 'std FM2\_F1EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'std\_FM2\_F1\_31-1-a': 'std FM2\_F1LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'std\_FM2\_F1\_31-2-a': 'std FM2\_F1LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'std\_FM2\_F1\_31-29-a': 'std FM2\_F1LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'std\_FM2\_F1\_31-4-a': 'std FM2\_F1LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'std\_FM2\_F1\_31-6-a': 'std FM2\_F1LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'std\_FM2\_F1\_31-7-a': 'std FM2\_F1LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'std\_FM2\_F1\_6-3-d': 'std FM2\_F1ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'std\_FM2\_F1\_6-4-d': 'std FM2\_F1ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'std\_FM2\_F1\_6-5-d': 'std FM2\_F1ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'std\_FM2\_F2\_1-36-a': 'std FM2\_F2LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'std\_FM2\_F2\_1-6-a': 'std FM2\_F2LA\_FM\_F2\_MD: Speed reference',  'std\_FM2\_F2\_27-0-a': 'std FM2\_F2EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'std\_FM2\_F2\_27-1-a': 'std FM2\_F2EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'std\_FM2\_F2\_31-1-a': 'std FM2\_F2LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'std\_FM2\_F2\_31-2-a': 'std FM2\_F2LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'std\_FM2\_F2\_31-29-a': 'std FM2\_F2LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'std\_FM2\_F2\_31-4-a': 'std FM2\_F2LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'std\_FM2\_F2\_31-6-a': 'std FM2\_F2LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'std\_FM2\_F2\_31-7-a': 'std FM2\_F2LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'std\_FM2\_F2\_6-3-d': 'std FM2\_F2ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'std\_FM2\_F2\_6-4-d': 'std FM2\_F2ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'std\_FM2\_F2\_6-5-d': 'std FM2\_F2ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'std\_FM2\_F3\_1-36-a': 'std FM2\_F3LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'std\_FM2\_F3\_1-7-a': 'std FM2\_F3LA\_FM\_F3\_MD: Speed reference',  'std\_FM2\_F3\_27-0-a': 'std FM2\_F3EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'std\_FM2\_F3\_27-1-a': 'std FM2\_F3EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'std\_FM2\_F3\_31-1-a': 'std FM2\_F3LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'std\_FM2\_F3\_31-2-a': 'std FM2\_F3LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'std\_FM2\_F3\_31-29-a': 'std FM2\_F3LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'std\_FM2\_F3\_31-4-a': 'std FM2\_F3LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'std\_FM2\_F3\_31-6-a': 'std FM2\_F3LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'std\_FM2\_F3\_31-7-a': 'std FM2\_F3LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'std\_FM2\_F3\_6-3-d': 'std FM2\_F3ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'std\_FM2\_F3\_6-4-d': 'std FM2\_F3ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'std\_FM2\_F3\_6-5-d': 'std FM2\_F3ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'std\_FM2\_F4\_1-36-a': 'std FM2\_F4LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'std\_FM2\_F4\_1-8-a': 'std FM2\_F4LA\_FM\_F4\_MD: Speed reference',  'std\_FM2\_F4\_27-0-a': 'std FM2\_F4EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'std\_FM2\_F4\_27-1-a': 'std FM2\_F4EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'std\_FM2\_F4\_31-1-a': 'std FM2\_F4LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'std\_FM2\_F4\_31-2-a': 'std FM2\_F4LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'std\_FM2\_F4\_31-29-a': 'std FM2\_F4LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'std\_FM2\_F4\_31-4-a': 'std FM2\_F4LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'std\_FM2\_F4\_31-6-a': 'std FM2\_F4LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'std\_FM2\_F4\_31-7-a': 'std FM2\_F4LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'std\_FM2\_F4\_6-3-d': 'std FM2\_F4ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'std\_FM2\_F4\_6-4-d': 'std FM2\_F4ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'std\_FM2\_F4\_6-5-d': 'std FM2\_F4ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'std\_FM2\_F5\_1-36-a': 'std FM2\_F5LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'std\_FM2\_F5\_1-9-a': 'std FM2\_F5LA\_FM\_F5\_MD: Speed reference',  'std\_FM2\_F5\_27-0-a': 'std FM2\_F5EA\_FM\_MEAS\_TEMP: FM exit temperature north',  'std\_FM2\_F5\_27-1-a': 'std FM2\_F5EA\_FM\_MEAS\_TEMP: FM exit temperature south',  'std\_FM2\_F5\_31-1-a': 'std FM2\_F5LA\_FM\_MEAS\_TG2: Profile Gauge act. thicknes deviation',  'std\_FM2\_F5\_31-2-a': 'std FM2\_F5LA\_FM\_MEAS\_TG2: Profile Gauge act. strip temperature',  'std\_FM2\_F5\_31-29-a': 'std FM2\_F5LA\_FM\_MEAS\_TG2: Profile gauge frame position',  'std\_FM2\_F5\_31-4-a': 'std FM2\_F5LA\_FM\_MEAS\_TG1: Thicknes Gauge act. thicknes deviation',  'std\_FM2\_F5\_31-6-a': 'std FM2\_F5LA\_FM\_MEAS\_WIDG: Width Gauge act centerline deviation',  'std\_FM2\_F5\_31-7-a': 'std FM2\_F5LA\_FM\_MEAS\_WIDG: Width Gauge act width',  'std\_FM2\_F5\_6-3-d': 'std FM2\_F5ED\_FM\_DESC\_WEST: Descaler West Valve on feedback',  'std\_FM2\_F5\_6-4-d': 'std FM2\_F5ED\_FM\_DESC\_MID: Descaler middle Valve on feedback',  'std\_FM2\_F5\_6-5-d': 'std FM2\_F5ED\_FM\_DESC\_EAST: Descaler East Valve on feedback',  'std\_FM2\_F6\_1-10-a': 'std FM2\_F6LA\_FM\_F6\_MD: Speed reference',  'std\_FM2\_F6\_1-36-a': 'std FM2\_F6LA\_FM\_COMF\_MRG: MG Strip v-act behind LAS',  'std\_FM2\_F6\_27-0-a': 'std 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Descaler middle Valve on feedback',  'std\_FM2\_F7\_6-5-d': 'std FM2\_F7ED\_FM\_DESC\_EAST: Descaler East Valve on feedback'} | 362 |

- Can we come up with more concise feature labels?

**Model**

|  |  |
| --- | --- |
| name | architecture |
| dnn\_v1\_hgroup\_2.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 512) 524800  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 1) 257  ================================================================= |
| dnn\_v1\_hgroup\_3.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 512) 524800  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 1) 257  ================================================================= |
| dnn\_v1\_hgroup\_4.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 512) 524800  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 1) 257  ================================================================= |
| dnn\_v1\_hgroup\_5.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 512) 524800  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 1) 257  ================================================================= |
| dnn\_v1\_hgroup\_6.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 512) 524800  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 1) 257  ================================================================= |
| cnn\_v0.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_1 (Conv2D) (None, 1, 1, 369) 6  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_1 (Flatten) (None, 369) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 369) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_1 (Dense) (None, 1) 370  ================================================================= |
| cnn\_v1.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_1 (Conv2D) (None, 3, 7, 369) 18  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_1 (Flatten) (None, 7749) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 7749) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_1 (Dense) (None, 512) 3968000  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 128) 65664  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 128) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 1) 129  ================================================================= |
| cnn\_v2.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_1 (Conv2D) (None, 8, 1, 369) 96  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_1 (Flatten) (None, 2952) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 2952) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_1 (Dense) (None, 512) 1511936  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 11) 5643  ================================================================= |
| cnn\_v3.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_1 (Conv2D) (None, 8, 1, 369) 96  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  conv2d\_2 (Conv2D) (None, 16, 1, 368) 272  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_1 (Flatten) (None, 5888) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 5888) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_1 (Dense) (None, 512) 3015168  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 128) 65664  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 128) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 11) 1419  ================================================================= |
| dnn\_v1.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 512) 524800  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 1) 257  ================================================================= |
| dnn\_v2.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 512) 524800  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 1) 257  ================================================================= |
| dnn\_v3.h5 | Layer (type) Output Shape Param #  =================================================================  dense\_1 (Dense) (None, 1024) 378880  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1024) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 256) 262400  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_3 (Dense) (None, 512) 131584  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_4 (Dense) (None, 256) 131328  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_4 (Dropout) (None, 256) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_5 (Dense) (None, 1) 257  ================================================================= |
| cnn\_combined\_QRT\_OXIDE\_v3\_QRT\_1.h5 |  |
| cnn\_combined\_QRT\_OXIDE\_v4\_QRT\_1.h5 |  |
| cnn\_combined\_v1\_hgroup\_2.h5 |  |
| cnn\_combined\_v1\_hgroup\_3.h5 |  |
| cnn\_combined\_v3\_hgroup\_3.h5 |  |
| cnn\_combined\_v4\_hgroup\_3.h5 |  |
| cnn\_v1\_filters\_16.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_4 (Conv2D) (None, 16, 1, 369) 192  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_7 (Dropout) (None, 16, 1, 369) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_4 (Flatten) (None, 5904) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_7 (Dense) (None, 512) 3023360  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_8 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_8 (Dense) (None, 1) 513  ================================================================= |
| cnn\_v1\_dropout\_04\_hgroup\_2.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_1 (Conv2D) (None, 8, 1, 369) 96  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 8, 1, 369) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_1 (Flatten) (None, 2952) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_2 (Dropout) (None, 2952) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_1 (Dense) (None, 512) 1511936  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_3 (Dropout) (None, 512) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_2 (Dense) (None, 1) 513  ================================================================= |
| cnn\_RM\_v10\_QRT\_1.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_1 (Conv2D) (None, 14, 11, 7) 140  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_1 (Flatten) (None, 1078) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 1078) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_1 (Dense) (None, 11) 11858  ================================================================= |
| cnn\_RM\_v11\_QRT\_1.h5 | Layer (type) Output Shape Param #  =================================================================  conv2d\_1 (Conv2D) (None, 27, 11, 7) 270  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  flatten\_1 (Flatten) (None, 2079) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dropout\_1 (Dropout) (None, 2079) 0  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  dense\_1 (Dense) (None, 11) 22869  ================================================================= |

* How to load combined models?
* Why did you train 11 different models for each defect family instead of training a 11-class classifier?

• Classification of Oxide

• Classification of all targets

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| CNN v0 | CNN v1 | CNN v2 |
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| Multilayer perceptron v0 |
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