

## FLIR Thermal Security Camera Range Data

### Assumptions:

- All range values are calculated using the Johnson Criteria unless marked as “VA” for video analytics
  - Johnson Criteria ranges are calculated using the criteria listed to the right
- VA range values represent the maximum distance to classify in the best-case scenario.
- Range data assumes good environmental conditions. Performance will be degraded in rain, fog, high humidity, etc.

The Johnson Criteria assume that the critical dimension for a human being is 0.75 meters. To get DRI, you need 1.5 pixels, 6 pixels and 12 pixels across 0.75 meters in the object plane. That means:

1.5 pixels/0.75m = 2 pixels per meter  
 6 pixels/0.75m = 8 pixels/meter  
 12 pixels/0.75m = 16 pixels/meter

Let us assume a man is 1.8m by 0.5m. So the man should be covered by:



**Detection =**  
**3.6 pixels by 1 pixel**  
 You can see something is there.

**Recognition =**  
**14.4 pixels by 4 pixels**  
 You can see that a person is there.

**Identification =**  
**28.8 pixels by 8 pixels**  
 You can see that the person is holding a rifle.

*Images only intended to represent the concept.*



FH-ID and FH-R:

|        |               | Thermal Imager Specs |           |               |                 |                    | Human                 |     |               |                 | Vehicle            |                       |     |  |
|--------|---------------|----------------------|-----------|---------------|-----------------|--------------------|-----------------------|-----|---------------|-----------------|--------------------|-----------------------|-----|--|
| Model  | Lens EFL [mm] | Pixel Pitch [um]     | Horiz Res | Detection [m] | Recognition [m] | Identification [m] | VA Classification [m] |     | Detection [m] | Recognition [m] | Identification [m] | VA Classification [m] |     |  |
|        |               |                      |           |               |                 |                    | Thermal               | Vis |               |                 |                    | Thermal               | Vis |  |
| FH-369 | 9             | 34                   | 320       | 133           | 33              | 17                 | 26                    | 72  | 407           | 102             | 51                 | 50                    | 119 |  |
| FH-324 | 13            | 34                   | 320       | 382           | 95              | 48                 | 74                    | 205 | 1171          | 293             | 146                | 122                   | 313 |  |
| FH-313 | 25            | 17                   | 320       | 705           | 176             | 88                 | 140                   | 394 | 2163          | 541             | 270                | 218                   | 580 |  |
| FH-ID  | 9             | 17                   | 640       | 266           | 66              | 33                 | 51                    | 72  | 815           | 203             | 102                | 88                    | 119 |  |
| FH-R   | 13            | 17                   | 640       | 417           | 104             | 52                 | 74                    | 102 | 1278          | 319             | 160                | 122                   | 165 |  |
|        | 25            | 17                   | 640       | 734           | 183             | 92                 | 140                   | 197 | 2249          | 561             | 282                | 217                   | 301 |  |
|        | 35            | 17                   | 640       | 1079          | 270             | 135                | 196                   | 276 | 3307          | 827             | 413                | 299                   | 414 |  |
|        | 50            | 17                   | 640       | 1528          | 382             | 191                | 280                   | 394 | 4686          | 1171            | 586                | 420                   | 580 |  |
|        | 60            | 17                   | 640       | 1833          | 458             | 229                | 336                   | 467 | 5623          | 1406            | 703                | 504                   | 697 |  |
|        | 75            | 17                   | 640       | 2236          | 559             | 279                | 420                   | 584 | 6857          | 1714            | 857                | 619                   | 870 |  |



FC-ID and FC-O:

| Model  | Lens EFL [mm] | Pixel Pitch [µm] | Horiz Res | Human         |                 |                    | Vehicle                              |               |                 |                    |                                      |
|--------|---------------|------------------|-----------|---------------|-----------------|--------------------|--------------------------------------|---------------|-----------------|--------------------|--------------------------------------|
|        |               |                  |           | Detection [m] | Recognition [m] | Identification [m] | VA Classification for ID version [m] | Detection [m] | Recognition [m] | Identification [m] | VA Classification for ID version [m] |
| FC-369 | 9             | 34               | 320       | 133           | 33              | 17                 | 32                                   | 407           | 102             | 51                 | 44                                   |
| FC-344 | 13            | 34               | 320       | 208           | 52              | 26                 | 51                                   | 639           | 160             | 80                 | 68                                   |
| FC-332 | 19            | 34               | 320       | 286           | 72              | 36                 | 70                                   | 879           | 220             | 110                | 93                                   |
| FC-324 | 13            | 17               | 320       | 382           | 95              | 48                 | 101                                  | 1171          | 293             | 146                | 134                                  |
| FC-317 | 19            | 17               | 320       | 539           | 135             | 67                 | 139                                  | 1654          | 413             | 207                | 185                                  |
| FC-313 | 25            | 17               | 320       | 705           | 176             | 88                 | 180                                  | 2163          | 541             | 270                | 230                                  |
| FC-309 | 35            | 17               | 320       | 996           | 249             | 125                | 255                                  | 3056          | 764             | 382                | 330                                  |
| FC-305 | 60            | 17               | 320       | 1698          | 424             | 212                | 440                                  | 5206          | 1302            | 651                | 586                                  |
| FC-304 | 75            | 17               | 320       | 2132          | 533             | 266                | 547                                  | 6538          | 1634            | 817                | 727                                  |
| FC-690 | 7.5           | 17               | 640       | 204           | 51              | 25                 | 50                                   | 625           | 156             | 78                 | 67                                   |
| FC-669 | 9             | 17               | 640       | 266           | 66              | 33                 | 65                                   | 815           | 203             | 102                | 87                                   |
| FC-644 | 13            | 17               | 640       | 417           | 104             | 52                 | 102                                  | 1278          | 319             | 160                | 136                                  |
| FC-632 | 19            | 17               | 640       | 573           | 143             | 72                 | 140                                  | 1757          | 439             | 220                | 186                                  |
| FC-625 | 25            | 17               | 640       | 734           | 183             | 92                 | 178                                  | 2249          | 561             | 282                | 240                                  |
| FC-617 | 35            | 17               | 640       | 1079          | 270             | 135                | 279                                  | 3307          | 827             | 413                | 370                                  |
| FC-610 | 60            | 17               | 640       | 1833          | 458             | 229                | 440                                  | 5623          | 1406            | 703                | 586                                  |
| FC-608 | 75            | 17               | 640       | 2236          | 559             | 279                | 547                                  | 6857          | 1714            | 857                | 727                                  |



PT-HD:

| Model    | Lens EFL [mm] | Pixel Pitch[um] | Horiz Res | Human         |                 |                    | Vehicle       |                 |                    |
|----------|---------------|-----------------|-----------|---------------|-----------------|--------------------|---------------|-----------------|--------------------|
|          |               |                 |           | Detection [m] | Recognition [m] | Identification [m] | Detection [m] | Recognition [m] | Identification [m] |
| PT-644   | 13            | 17              | 640       | 417           | 104             | 52                 | 1278          | 319             | 160                |
| PT-625   | 25            | 17              | 640       | 733           | 183             | 92                 | 2249          | 562             | 281                |
| PT-617   | 35            | 17              | 640       | 1079          | 270             | 135                | 3307          | 827             | 413                |
| PT-612   | 50            | 17              | 640       | 1528          | 382             | 191                | 4686          | 1171            | 586                |
| PT-608   | 75            | 17              | 640       | 2132          | 533             | 266                | 6538          | 1634            | 817                |
| PT-606Z  | 105           | 17              | 640       | 3056          | 764             | 382                | 9371          | 2343            | 1171               |
| PT-602CZ | 275           | 15              | 640       | 12941         | 4007            | 3289               | 19904         | 8419            | 7238               |



F-ID:

| Model    | Lens EFL [mm] | Pixel Pitch [µm] | Horiz Res | Human         |                 |                    | Vehicle               |               |                 |                    |                       |
|----------|---------------|------------------|-----------|---------------|-----------------|--------------------|-----------------------|---------------|-----------------|--------------------|-----------------------|
|          |               |                  |           | Detection [m] | Recognition [m] | Identification [m] | VA Classification [m] | Detection [m] | Recognition [m] | Identification [m] | VA Classification [m] |
| F-644 ID | 13            | 17               | 640       | 417           | 104             | 52                 | 102                   | 1278          | 319             | 160                | 145                   |
| F-625 ID | 25            | 17               | 640       | 733           | 183             | 92                 | 178                   | 2249          | 562             | 281                | 256                   |
| F-617 ID | 35            | 17               | 640       | 1079          | 270             | 135                | 263                   | 3307          | 827             | 413                | 376                   |
| F-612 ID | 50            | 17               | 640       | 1528          | 382             | 191                | 373                   | 4686          | 1171            | 586                | 533                   |
| F-610 ID | 65            | 17               | 640       | 1910          | 477             | 239                | 447                   | 5857          | 1464            | 732                | 640                   |
| F-608 ID | 75            | 17               | 640       | 2132          | 533             | 266                | 520                   | 6538          | 1634            | 817                | 744                   |
| F-606 ID | 100           | 17               | 640       | 2957          | 739             | 370                | 721                   | 9069          | 2267            | 1134               | 1032                  |



FB-ID and FB-O:

| Model  | Lens EFL [mm] | Pixel Pitch [um] | Horiz Res | Human         |                 |                    | Vehicle                              |               |                 |                    |                                      |
|--------|---------------|------------------|-----------|---------------|-----------------|--------------------|--------------------------------------|---------------|-----------------|--------------------|--------------------------------------|
|        |               |                  |           | Detection [m] | Recognition [m] | Identification [m] | VA Classification for ID version [m] | Detection [m] | Recognition [m] | Identification [m] | VA Classification for ID version [m] |
| FB-393 | 3.7           | 17               | 320       | 99            | 25              | 12                 | 24                                   | 302           | 76              | 38                 | 34                                   |
| FB-349 | 6.8           | 17               | 320       | 187           | 47              | 23                 | 46                                   | 574           | 143             | 72                 | 65                                   |
| FB-324 | 12.8          | 17               | 320       | 382           | 95              | 48                 | 93                                   | 1171          | 293             | 146                | 133                                  |
| FB-312 | 18            | 12               | 320       | 764           | 191             | 95                 | 186                                  | 2343          | 586             | 293                | 266                                  |
| FB-309 | 24            | 12               | 320       | 1019          | 255             | 127                | 248                                  | 3124          | 781             | 390                | 355                                  |
| FB-695 | 4.9           | 12               | 640       | 193           | 48              | 24                 | 47                                   | 592           | 148             | 74                 | 67                                   |
| FB-650 | 8.7           | 12               | 640       | 367           | 92              | 46                 | 89                                   | 1125          | 281             | 141                | 128                                  |
| FB-632 | 14            | 12               | 640       | 573           | 143             | 72                 | 140                                  | 1757          | 439             | 220                | 200                                  |
| FB-618 | 24            | 12               | 640       | 1019          | 255             | 127                | 248                                  | 3124          | 781             | 390                | 355                                  |



DM-Series:

| Model  | Lens EFL [mm] | Pixel Pitch[um] | Horiz Res | Human        |                 |                    | Vehicle      |                 |                    |
|--------|---------------|-----------------|-----------|--------------|-----------------|--------------------|--------------|-----------------|--------------------|
|        |               |                 |           | Detection[m] | Recognition [m] | Identification [m] | Detection[m] | Recognition [m] | Identification [m] |
| DM-392 | 2.3           | 12              | 320       | 100          | 25              | 12                 | 306          | 76              | 38                 |
| DM-350 | 4.3           | 12              | 320       | 183          | 46              | 23                 | 562          | 141             | 70                 |
| DM-324 | 9.1           | 12              | 320       | 382          | 95              | 48                 | 1171         | 293             | 146                |
| DM-312 | 18            | 12              | 320       | 764          | 191             | 95                 | 2343         | 586             | 293                |
| DM-695 | 4.9           | 12              | 640       | 193          | 48              | 24                 | 592          | 148             | 74                 |
| DM-650 | 8.7           | 12              | 640       | 367          | 92              | 46                 | 1125         | 281             | 141                |
| DM-624 | 18            | 12              | 640       | 764          | 191             | 95                 | 2343         | 586             | 293                |
| DM-612 | 36            | 12              | 640       | 1528         | 382             | 191                | 4686         | 1171            | 586                |



DX-Series:

| Model  | Lens EFL [mm] | Pixel Pitch[um] | Horiz Res | Human         |                 |                    | Vehicle       |                 |                    |
|--------|---------------|-----------------|-----------|---------------|-----------------|--------------------|---------------|-----------------|--------------------|
|        |               |                 |           | Detection [m] | Recognition [m] | Identification [m] | Detection [m] | Recognition [m] | Identification [m] |
| DX-350 | 4.3           | 12              | 320       | 183           | 46              | 23                 | 562           | 141             | 70                 |
| DX-324 | 9.1           | 12              | 320       | 382           | 95              | 48                 | 1171          | 293             | 146                |
| DX-312 | 18            | 12              | 320       | 764           | 191             | 95                 | 2343          | 586             | 293                |
| DX-306 | 36            | 12              | 320       | 1528          | 382             | 191                | 4686          | 1171            | 586                |
| DX-650 | 8.7           | 12              | 640       | 367           | 92              | 46                 | 1125          | 281             | 141                |
| DX-624 | 18            | 12              | 640       | 764           | 191             | 95                 | 2343          | 586             | 293                |
| DX-612 | 36            | 12              | 640       | 1528          | 382             | 191                | 4686          | 1171            | 586                |
| DX-608 | 55            | 12              | 640       | 2292          | 573             | 286                | 7028          | 1757            | 879                |



HDC MR UC

|        | Model    | Lens EFL<br>[mm] | Horiz<br>Res | Human            |                    |                       | Vehicle          |                    |                       |
|--------|----------|------------------|--------------|------------------|--------------------|-----------------------|------------------|--------------------|-----------------------|
|        |          |                  |              | Detection<br>[m] | Recognition<br>[m] | Identification<br>[m] | Detection<br>[m] | Recognition<br>[m] | Identification<br>[m] |
| HDC MR | Uncooled | 183              | 1024         | 5400             | 1480               | 675                   | 13000            | 4150               | 1870                  |