# Photovoltaic Power Plant Inspection Report

## Vlčková 177, Vlčková, 763 19, Česko

**ORDER**
ORD-2026-000499

**REPORT NUMBER**
REP-2026-000158

**STANDARD**
According to: IEC TS 62446-3

**ADDRESS**
Vlčková 177, Vlčková, 763 19, Česko

**GPS**
49.3126588, 17.7510513

**INSPECTION DATE AND TIME**
2026-08-13 17:30

**REPORT CREATION DATE**
2026-08-24 12:12

The photovoltaic power plant inspection report meets the material, technical, personnel and software requirements for a quality output used to identify module and cell faults by drone-based thermography of photovoltaic systems in accordance with IEC TS 62446-3.

## OVERALL ASSESSMENT

| 20 | High | 3 | 60 |
|---|---|---|---|
| TOTAL ANOMALIES across 2 jobs | OVERALL SEVERITY 2× High · 1× Medium · 17× Low | ANOMALY TYPES | MODULES DETECTED |

A total of 20 anomalies were found on 20 modules of the inspected photovoltaic power plant.

The total estimated annual power loss is **2,216.64 kWh**.

## CLIENT

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## INSPECTION PROCESSOR

**COMPANY**
DroneTech s.r.o.

**LEGAL ADDRESS**
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## PILOT

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**DRONE OPERATOR NO.**
CZE-RP-vfetdp3qviw0

## ANALYSIS PROCESSOR

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## POWER PLANT

**POWER**
14

**MODULES (NUMBER OF MODULES)**
60

**STRUCTURE**
Střešní konstrukce

## WEATHER

**HUMIDITY**
51

**TEMPERATURE**
27,4

**WIND SPEED**
0

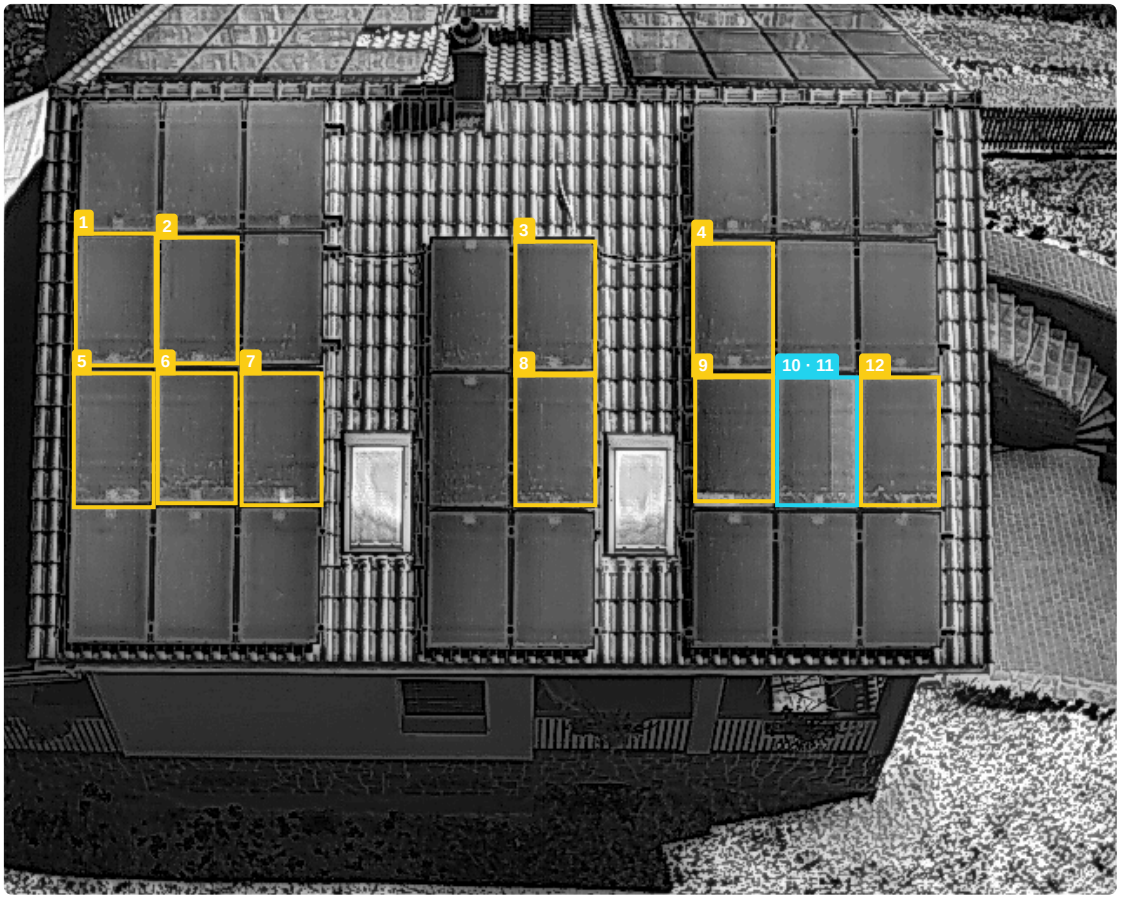
**INTENSITY OF SOLAR RADIATION**
829

**CLOUD COVER**
Jasno

## INSPECTION

**INSPECTION TYPE**
Default

**IMAGE 1/2 — INFRARED (IR)** DJI_20260811115949_0001_T.jpeg

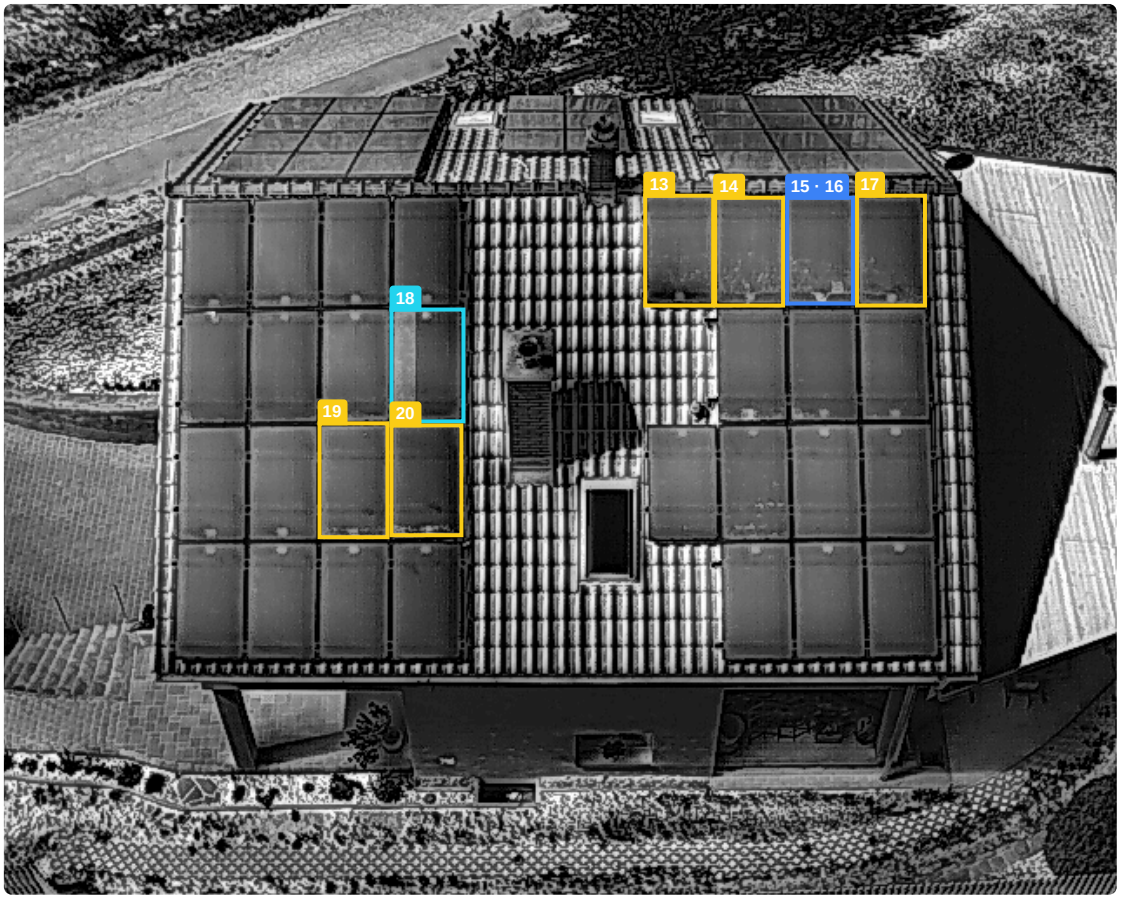



**VISIBLE LIGHT (RGB)** DJI_20260811115949_0001_V.jpeg


**1** Soiling **2** Soiling **3** Soiling **4** Soiling **5** Soiling **6** Soiling **7** Soiling **8** Soiling **9** Soiling **10** Bypass diode **11** Soiling **12** Soiling

Each box shows the anomaly number(s) used in the table below; the key above maps every number to its anomaly type.

**IMAGE 2/2 — INFRARED (IR)** DJI_20260811120009_0003_T.jpeg




**VISIBLE LIGHT (RGB)** DJI_20260811120009_0003_V.jpeg


**13** Soiling **14** Soiling **15** Cell overheating **16** Soiling **17** Soiling **18** Bypass diode **19** Soiling **20** Soiling

Each box shows the anomaly number(s) used in the table below; the key above maps every number to its anomaly type.

## OVERALL ASSESSMENT

| ANOMALY NAME | NUMBER OF ANOMALIES *(1) | NUMBER OF MODULES *(2) | ESTIMATED POWER LOSS (KW) *(3) | ESTIMATED POWER LOSS (%) *(4) | ESTIMATED ANNUAL POWER LOSS (KWH) * (5) |
|---|---|---|---|---|---|
| Soiling | 17 | 17 | 1.98 kW | 14.17 % | 1,983.33 kWh |
| Bypass diode | 2 | 2 | 0.16 kW | 1.11 % | 155.54 kWh |
| Cell overheating | 1 | 1 | 0.08 kW | 0.56 % | 77.77 kWh |
| **Total** | **20** | **20** | **2.22 kW** | | **2,216.64 kWh** |

*(1) Anomaly: Number of occurrences of a given anomaly type.

*(2) Modules: Number of modules affected by the given anomaly type.

*(3) Estimated Power Loss (kW): The estimated power loss is defined as the product of the number of affected modules, the plant's peak power (STC), and the anomaly-specific performance impact factor (on a scale from 0 to 1).

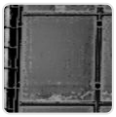
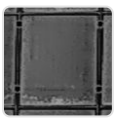
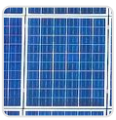
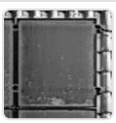
*(4) Estimated Power Loss (%): The estimated power loss expressed as the ratio of the lost power to the plant's total capacity, shown in percentage terms.

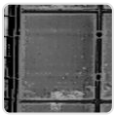
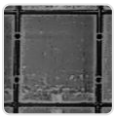
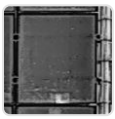
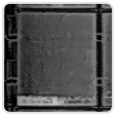
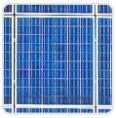
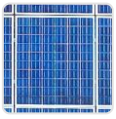
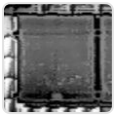
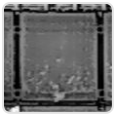
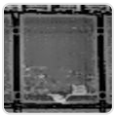
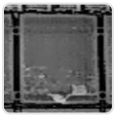
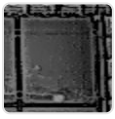
*(5) Estimated Annual Power Loss (kWh): The estimated annual energy loss in kilowatt-hours, calculated as the power loss multiplied by the number of solar hours per year.

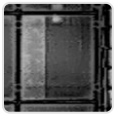
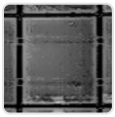
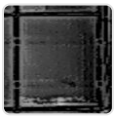
## ANOMALY BREAKDOWN

| 20 | 0 | 2 | 1 | 17 |
|---|---|---|---|---|
| TOTAL ANOMALIES | CRITICAL | HIGH | MEDIUM | LOW |

**3**
ANOMALY TYPES

| # | PRIMARY IMAGE | SECONDARY IMAGE | ANOMALY NAME | ROW | POSITION | AI JOB | ΔT | MAX °C | MIN °C | MEAN °C | PRIORITY (SEVERITY) | RECOMMENDED NEXT STEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 |  |  | Soiling | 2 | 1 | AIR-2026-001077 | 3.9 | 44.5 | 21.7 | 41.2 | Low | Repair |
| 2 |  |  | Soiling | 2 | 2 | AIR-2026-001077 | 3.8 | 44.5 | 19.9 | 41.2 | Low | Repair |
| 3 |  |  | Soiling | 2 | 5 | AIR-2026-001077 | 7.5 | 47.9 | 19.0 | 42.1 | Low | Repair |

| # | PRIMARY IMAGE | SECONDARY IMAGE | ANOMALY NAME | ROW | POSITION | AI JOB | ΔT | MAX °C | MIN °C | MEAN °C | PRIORITY (SEVERITY) | RECOMMENDED NEXT STEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 |  |  | Soiling | 2 | 6 | AIR-2026-001077 | 3.5 | 44.0 | 15.5 | 41.3 | Low | Repair |
| 5 |  |  | Soiling | 3 | 1 | AIR-2026-001077 | 5.3 | 45.8 | 19.9 | 41.6 | Low | Repair |
| 6 |  |  | Soiling | 3 | 2 | AIR-2026-001077 | 3.9 | 44.3 | 20.0 | 41.5 | Low | Repair |
| 7 |  |  | Soiling | 3 | 3 | AIR-2026-001077 | 11.3 | 52.8 | 19.9 | 41.0 | Low | Repair |
| 8 |  |  | Soiling | 3 | 5 | AIR-2026-001077 | 6.4 | 47.0 | 20.4 | 41.9 | Low | Repair |
| 9 |  |  | Soiling | 3 | 6 | AIR-2026-001077 | 7.0 | 47.6 | 19.6 | 40.3 | Low | Repair |
| 10 |  |  | Bypass diode | 3 | 7 | AIR-2026-001077 | 6.4 | 47.0 | 20.9 | 43.1 | High | Monitoring |
| 11 |  |  | Soiling | 3 | 7 | AIR-2026-001077 | 6.4 | 47.0 | 20.9 | 43.1 | Low | Repair |
| 12 |  |  | Soiling | 3 | 8 | AIR-2026-001077 | 6.3 | 47.5 | 22.6 | 43.1 | Low | Repair |
| 13 |  |  | Soiling | 1 | 5 | AIR-2026-001078 | 11.4 | 51.7 | 22.5 | 42.3 | Low | Repair |
| 14 |  |  | Soiling | 1 | 6 | AIR-2026-001078 | 5.2 | 45.6 | 17.1 | 43.0 | Low | Repair |
| 15 |  |  | Cell overheating | 1 | 7 | AIR-2026-001078 | 6.9 | 47.4 | 20.0 | 42.5 | Medium | Monitoring |
| 16 |  |  | Soiling | 1 | 7 | AIR-2026-001078 | 6.9 | 47.4 | 20.0 | 42.5 | Low | Repair |
| 17 |  |  | Soiling | 1 | 8 | AIR-2026-001078 | 3.7 | 44.0 | 19.8 | 39.3 | Low | Repair |

| # | PRIMARY IMAGE | SECONDARY IMAGE | ANOMALY NAME | ROW | POSITION | AI JOB | ΔT | MAX °C | MIN °C | MEAN °C | PRIORITY (SEVERITY) | RECOMMENDED NEXT STEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 |  |  | Bypass diode | 2 | 4 | AIR-2026-001078 | 6.4 | 46.8 | 12.2 | 40.6 | High | Monitoring |
| 19 |  |  | Soiling | 3 | 3 | AIR-2026-001078 | 5.1 | 45.6 | 19.0 | 42.1 | Low | Repair |
| 20 |  |  | Soiling | 3 | 4 | AIR-2026-001078 | 5.2 | 46.0 | 15.2 | 38.7 | Low | Repair |

## AERIAL THERMOGRAPHIC MEASUREMENT AND DATA PROCESSING

For this report, an aerial thermographic inspection methodology was used. Unmanned aerial vehicles (drones) captured infrared thermal and color images of the photovoltaic modules. The assessment was carried out in accordance with the requirements of IEC TS 62446-3. The methodology enables the detection of thermal anomalies, diagnosis of system faults and precise localization of identified findings.

The flight and image acquisition process was optimized so that the data could be collected within a short period and under homogeneous weather conditions, particularly stable solar irradiance. This reduced the influence of changing conditions and enabled a consistent analysis of individual modules.

The analysis was supported by high-spatial-resolution imagery, allowing anomalies to be identified at string, module and individual photovoltaic cell level.

To ensure accuracy, the infrared and color data were compared with each other and manually checked.

## ANALYZED ANOMALIES

1. **Cell:** A localized thermal anomaly affecting a single photovoltaic cell, which may indicate damage, a manufacturing defect or progressive degradation.
2. **Cell Multi:** Multiple thermal anomalies affecting cells within one module, which may indicate more extensive damage or degradation of the panel.
3. **Reverse Polarity:** A regular checkerboard pattern of alternating warmer and cooler cells, typically associated with incorrect electrical wiring or reversed polarity and potentially reducing module output.
4. **Internal Short Circuit:** An extended thermal anomaly associated with a possible internal short circuit in a module or one of its sections, which may cause continuous area heating and reduced output.
5. **Diode:** An anomaly affecting one section of a module and associated with the activation or failure of a bypass diode, potentially reducing the panel output by approximately one third.
6. **Diode Multi:** An anomaly affecting multiple sections of a module and associated with the activation or failure of multiple bypass diodes, potentially causing a significant reduction in panel output.
7. **Module:** A thermal anomaly affecting the entire photovoltaic module, which may be associated with disconnection, an electrical fault or overall degradation.
8. **String:** An anomaly affecting a group of interconnected modules, which may indicate a fault reducing the output of the entire string.
9. **Combiner:** An anomaly associated with the common connection of multiple strings, which may indicate a fault in the combiner, protection devices, cabling or electrical connections.

10. **Cracking:** Cracking or other mechanical damage to a module, which may lead to localized overheating, reduced output and increased safety risk.
11. **Shading:** Shading of a panel by a nearby object, obstruction or vegetation, which limits incoming solar irradiance and reduces energy production.
12. **Soiling:** Contamination of the panel surface by dust, bird droppings or other deposits, which may cause uneven heating and reduced output.