# Package: inmetr (via r-universe)

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**Title** Access Brazilian Automatic Weather Station Data

**Version** 0.1.0

**Depends** R (>= 4.2.0)

**Description** Download verified INMET automatic weather station data, query hourly and daily observations lazily with DuckDB, and find stations near Brazilian municipality seats.

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**URL** https://viniciusoike.github.io/inmetr/, https://github.com/viniciusoike/inmetr

**BugReports** https://github.com/viniciusoike/inmetr/issues

**Encoding** UTF-8

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**Suggests** curl, testthat (>= 3.0.0), withr, geobr, here, sf

**Config/pak/sysreqs** libicu-dev

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`inmet_cache_clear` *Clear the inmetr data cache*

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## Description

Clear the inmetr data cache

## Usage

```
inmet_cache_clear(ask = interactive())
```

## Arguments

| | |
|---|---|
| `ask` | Whether to ask for confirmation before deleting cached files. |

## Value

Invisibly returns whether files were removed.

## Examples

```
inmet_cache_clear()
```

---

`inmet_cache_dir` *Locate the inmetr cache*

---

## Description

Locate the inmetr cache

## Usage

```
inmet_cache_dir()
```

## Value

The cache directory path.

## Examples

```
inmet_cache_dir()
```

## inmet_nearest *Find stations nearest a municipality seat*

### Description

Ranks stations by great-circle (haversine) distance from each municipality's seat.

### Usage

```
inmet_nearest(muni, n = 1, max_km = NULL, state = NULL, status = NULL)
```

### Arguments

| | |
|---|---|
| muni | One or more seven-digit IBGE municipality codes or municipality names. |
| n | Maximum number of stations to return per municipality. |
| max_km | Optional maximum distance in kilometres. |
| state | Optional two-letter state abbreviation for name matching. Either one value for every muni or one value per muni; use NA to skip an element. |
| status | Optional station statuses to keep: any of "operating", "broken" and "closed". See inmet_stations() for their meaning. NULL keeps every station. |

### Value

A tibble with the station metadata from inmet_stations(), distance_km, and a first column code_muni_query with the IBGE code each row answers. Rows follow the order of muni, then distance.

### Examples

```
inmet_nearest("Campinas", n = 3)
inmet_nearest(c(3550308, 3304557), status = "operating")
```

## inmet_stations *Read INMET station metadata*

### Description

Read INMET station metadata

### Usage

```
inmet_stations()
```

## Value

A tibble of station metadata.

## Station status

`status` records each station's state in the INMET station catalog used to build the release:

- `"operating"`: listed as operating (*Operante*).
- `"broken"`: listed as faulty (*Pane*). The station may have stopped reporting recently or may still report with gaps, but its earlier observations are kept. Check `last_obs` and the coverage of the variables you need before dropping it.
- `"closed"`: absent from the catalog, though the historical files hold observations for it. `last_obs` gives its last observation in the release.

## Examples

```
inmet_stations()
```

---

# read_inmet *Read INMET observations lazily*

---

## Description

Downloads the selected yearly Parquet files to the cache once and returns a lazy table. Filter and summarise it with dplyr, then call `dplyr::collect()` to bring the result into R.

## Usage

```
read_inmet(table = c("daily", "hourly"), years = NULL)
```

## Arguments

| | |
|---|---|
| `table` | Either `"daily"` or `"hourly"`. |
| `years` | Years to download; `NULL` selects all available years. |

## Details

Values are INMET's as published, except that `-9999` and blanks become `NA`. The release applies no outlier filter or coverage threshold. Its last year is usually partial: the `2026-10-24` release ends on 28 February 2025.

## Value

A lazy dbplyr table backed by DuckDB.

### Hourly table

One row per station and hour in INMET's files, including hours where every measurement is missing.

| Column | Meaning |
|---|---|
| code_station | INMET station code |
| timestamp_utc | Observation time, UTC |
| date_local, month, day, hour_local | Local date and its parts, at the station's fixed standard UTC offset (no da |
| year | UTC year; years selects on it |
| precip_mm | Precipitation in the hour, mm |
| pressure_station_hpa | Station pressure, hPa |
| pressure_max_hpa, pressure_min_hpa | Pressure extremes in the previous hour, hPa |
| radiation_kj_m2 | Global radiation, kJ/m² |
| temp_dry_bulb_c | Dry-bulb air temperature, °C |
| temp_dew_point_c | Dew-point temperature, °C |
| temp_max_c, temp_min_c | Air-temperature extremes in the previous hour, °C |
| temp_dew_point_max_c, temp_dew_point_min_c | Dew-point extremes in the previous hour, °C |
| rel_humidity_pct | Relative humidity, % |
| rel_humidity_max_pct, rel_humidity_min_pct | Relative-humidity extremes in the previous hour, % |
| wind_direction_deg | Wind direction, degrees |
| wind_speed_ms | Wind speed, m/s |
| wind_gust_ms | Maximum gust in the previous hour, m/s |
| code_muni, name_muni, abbrev_state | Station's IBGE municipality code, name, and state |

### Daily table

The pipeline aggregates hourly rows by station and date_local. Every available hour contributes, and an aggregate is NA only when all of its hourly inputs are missing, so a daily sum is never zero for lack of data.

| Column | Meaning |
|---|---|
| code_station | INMET station code |
| date | Local date |
| year, month, day | Parts of the local date; years selects on year |
| day_of_year | Day of the year, 1–366 |
| week, weekday | ISO week (1–53) and ISO weekday (Monday = 1) |
| n_hours | Hours with at least one non-missing measurement, 0–24 |
| n_hours_temp_mean | Hours contributing to the daily mean temperature, 0–24 |
| n_hours_temp_min, n_hours_temp_max | Hours contributing to the daily temperature extremes, includin |
| n_hours_temp_dew_point_mean | Hours contributing to the daily mean dew point, 0–24 |
| n_hours_rel_humidity_mean | Hours contributing to the daily mean relative humidity, 0–24 |
| n_hours_rel_humidity_min, n_hours_rel_humidity_max | Hours contributing to the daily humidity extremes, including t |
| n_hours_precip_total | Hours contributing to the daily precipitation total, 0–24 |
| n_hours_radiation_total | Hours contributing to the daily radiation total, 0–24 |
| n_hours_pressure_station_mean | Hours contributing to the daily mean station pressure, 0–24 |
| n_hours_wind_speed_mean | Hours contributing to the daily mean wind speed, 0–24 |
| n_hours_wind_gust_max | Hours contributing to the daily maximum gust, 0–24 |

| | |
|---|---|
| temp_mean_c | Mean dry-bulb temperature, °C |
| temp_min_c, temp_max_c | Lowest and highest hourly air-temperature extreme, °C; see be |
| temp_dew_point_mean_c | Mean dew-point temperature, °C |
| rel_humidity_mean_pct | Mean relative humidity, % |
| rel_humidity_min_pct, rel_humidity_max_pct | Lowest and highest hourly relative-humidity extreme, %; see b |
| precip_total_mm | Total precipitation, mm |
| radiation_total_kj_m2 | Total global radiation, kJ/m² |
| pressure_station_mean_hpa | Mean station pressure, hPa |
| wind_speed_mean_ms | Mean wind speed, m/s |
| wind_gust_max_ms | Highest gust, m/s |
| code_muni, name_muni, abbrev_state | Station's IBGE municipality code, name, and state |

Three features of the daily table need care.

- **Empty days.** INMET's files list hours with no measurements, so the daily table has rows with `n_hours == 0` and every measurement `NA`. Counting rows per station-year therefore counts calendar days, not days with data. Filter on `n_hours` first.
- `n_hours` **counts hours with any measurement.** A day can have `n_hours == 24` while one variable is missing all day. Each `n_hours_*` column counts the non-missing hourly inputs of its own aggregate, so use it to filter coverage for that variable. The counts include both the previous-hour extreme and its hourly fallback for `temp_min_c`, `temp_max_c`, `rel_humidity_min_pct`, and `rel_humidity_max_pct`. Schema 3 adds these columns; the pinned `2026-10-24` release predates them, and on that release the hourly table gives the same counts.
- **Extremes fall back to the hourly reading.** For each hour, `temp_max_c` uses the hourly maximum when present and `temp_dry_bulb_c` otherwise. `temp_min_c`, `rel_humidity_max_pct` and `rel_humidity_min_pct` work the same way. When the extreme field is missing for long spells, the daily extremes come from the hourly reading alone.

## Known data problems

The release keeps INMET's values, including some implausible temperatures that `n_hours` filters do not catch.

| Station | Years | Problem |
|---|---|---|
| A201 Belém/PA | 2005–2006 | The 99th percentile of hourly `temp_max_c` minus `temp_dry_bulb_c` is 5.8 °C, against 3.9 ° |
| A303 Maceió/AL | 2004–2005 | 60 and 92 days with `temp_max_c` of 35 °C or more, against at most 5 in any later year |
| A409 Aracaju/SE | 2021 | Hourly `temp_max_c` missing on 130 days; daily maxima reach 35 °C or more on 73 days, 7 |

No temperature in the release exceeds 45.0 °C, and values do not bunch at 45.0 °C. Treat readings near 45 °C with suspicion.

## Examples

```
daily <- read_inmet("daily", 2024)
dplyr::collect(dplyr::filter(daily, .data$code_muni == 3550308L))
```

```
# Hours per day with a measured temp_max_c, to drop days that rely on the
# dry-bulb fallback
read_inmet("hourly", 2021) |>
  dplyr::filter(.data$code_station == "A409") |>
  dplyr::summarise(
    n_hours_temp_max = sum(as.integer(!is.na(.data$temp_max_c)), na.rm = TRUE),
    .by = c("code_station", "date_local")
  ) |>
  dplyr::collect()

# Schema 3 counts include fallback readings for daily extremes.
if ("n_hours_temp_max" %in% colnames(daily)) {
  daily |>
    dplyr::filter(.data$n_hours_temp_max >= 18) |>
    dplyr::collect()
}
```

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