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Device keeps tabs on way wind blows, secures metro

TECH TRACKING WEATHER CHANGES

The device came in handy during cyclone Vardah when wind speeds hit 140kmph

Anemometer measures wind velocity

MEASURING WIND SPEED

- **Common types of anemometers have three or four cups attached to horizontal arms** that are in turn attached to a vertical rod
- The cups rotate when the wind blows making the rod spin. **The stronger the wind, the faster the rod spins**
- The **number of rotations are used in calculating wind speed**

AT METRO STATIONS

Anemometers are installed in the Koyambedu, Alandur and Airport stations on the elevated line

WIND VELOCITY	TRAIN SPEED
70 kmph	70kmph to 80kmph (average speed)
70kmph and 90kmph	25kmph
above 90kmph	Train operations stopped

OTHER MEASURES

- Operational underground metro stations **have mechanisms to drain rainwater**
- In partially constructed underground stations, **pumps have been installed to prevent water stagnation**
- **In tunneling locations, bunds have been constructed** to prevent water ingress
- At the CMRL depot in Koyambedu, storm water drains are **connected to a pond behind to ensure free flow of water**

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While meteorologists get busy behind computers to generate monsoon forecasts and warnings, alerts from a tiny device are ensuring that metro trains are protected from extreme weather conditions on the elevated corridor.

Chennai Metro Rail Limited (CMRL) has installed anemometers, devices that will measure wind velocity, in strategic locations to get real-time data. The anemometer, which measures wind speed by the rotation of the cups attached to horizontal arms, constantly generates data. As the trains operate across the corridors at a height of 15m to 24m from the road, wind is one of the critical factors that affect movement of trains.

Three such anemometers are installed on the roof of the Koyambedu, Alandur and Airport metro stations, as they are located in three different corners of the city and also have a large footfall. "These anemometers are critical in metro train operations on the elevated corridors," a metrorail official said. They came in handy during cyclone Vardah when operations were stopped for nearly an hour when the wind speed reached 140kmph. "In underground corridors, it is water stagnation that needs to be tackled," he added.

Larger anemometers are used in the meteorological department, as keeping track of wind velocity is key to weather prediction. Southern Railway has also installed it in five bridges in the state including the Pamban bridge. Station masters receive the data and stop trains in case of a gale.

In the three stations along the elevated section of the metro, the station controller keeps a watch on the wind speed during train operations from 6am to 10pm. They keep the operation control centre (OCC) located in the Chennai Metro Rail headquarters in Koyambedu informed on the wind velocity. The OCC monitors and controls operations of the trains.

According to CMRL, trains can operate at its maximum speed of 80kmph till a wind speed of 70kmph. The train speed is reduced and is restricted to 25kmph, when winds blow between 70kmph and 90kmph. Above 90kmph, train operations are halted.

Officials said the wind speeds vary with the stations as the trains operate at different heights. At Vadapalani metro station, the trains run on the elevated viaduct at a height of about 16m, while at Kathipara, it runs above the clover leaf flyover at a height of 24m. "If the installed anemometer stops working during extreme weather conditions like a cyclone, station controllers use portable anemometers that are on standby," a metrorail official said.