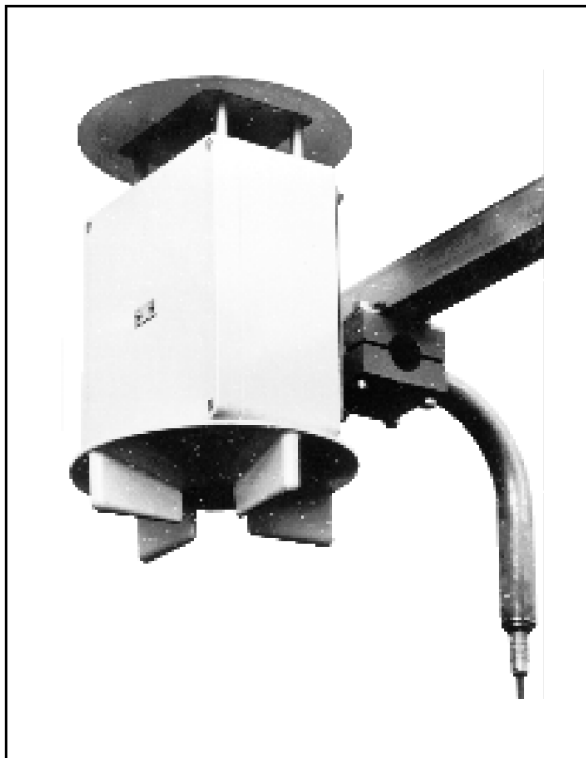


# Fog and Frost Detection System THYGAN EK33



© by BOSCHUNG MECA TRONIC / 12.1998 / E

### FEATURES

- Detects fog by means of a precise water vapour measurement
- Thermohygrometric, non-optical, measurement method, based on a sensor proven over a number of years
- Integrated air temperature sensor
- Maintenance-free operation for a period of several years
- No measurable ageing
- No problems with dirt
- The highly accurate and reliable humidity values improve black-ice early warning (danger of slippery frost on cold road surface)

### OPERATING DESCRIPTION

At the heart of the THYGAN EK33 system is a high precision, computer-controlled **dew point mirror-thermohygrometer**. For use in fog detection systems, this measuring principle has been refined in the past few years. THYGAN EK33 measures both **air temperature** and **dew point temperature** with very high accuracy. From these two temperatures, the **relative humidity** is calculated. The sensor housing is heated if there is danger of fog. When fog actually arrives, the heating causes the fog droplets to evaporate. The dew point mirror then measures the artificially increased water vapour pressure so produced. As a result, the measurement results include information concerning the fog density. The apparatus resists street air pollution: the critical internal sensor components are well protectively

installed, and in addition, are cleaned on a regular basis by means of a cleaning mechanism.

The **cooled dew-point mirror measuring principle** is conservative, i.e. a physically well-defined procedure is made use of. A regular calibration check within the scope of quality assurance is therefore necessary at most in 5-year periods.

The THYGAN EK33 fog detection system consists of two parts:

- a) THYGAN EK33-G transmitter
- b) THYGAN EK33-St control unit

The distance between the two parts, assuming a cable of suitable cross-section, can be up to 500 m. This is also valid for the distance between the control unit and data collection.

### Technical Specification

DV.00678.4

#### REFERENCE

The base instrument is a well-known meteorological sensor, which has proved itself in the base network of the Swiss weather service for over 10 years.

The THYGAN EK33 system has been successfully tested in the "Erlkönig" experiment on the A1 mo-

torway in central Switzerland during two winters ("Erlkönig" is the title of a Goethe tragedy). The results of the experiment were presented on the occasion of the 9<sup>th</sup> SIRWEC Conference in Lulea, Sweden in March 1998.

#### SPECIFICATIONS

##### Primary parameters measured

- Air temperature : -50°C to +55°C
- Dew point temperature : -60°C to +50°C
- Relative humidity : 4% to 100%
- Measuring cycle : 1 set of data per 10 minutes

##### Resolution

- Temperature values : 0.01 K
- Relative humidity : 0.01%

##### Measuring accuracy

- : ±0.15 K from -20°C to +50°C
- ±0.25 K from -65°C to -20°C

##### Evaluations

- Fog detection : 1<sup>st</sup> step: danger of fog  
2<sup>nd</sup> step: light fog (visibility ~150 to 300 m)  
3<sup>rd</sup> step: heavy fog (visibility <150 m)

##### Status

- : system operational condition

##### Outputs

- : RS232 or RS485  
bit rate 2400 bps (fixed)

##### Data memory

- Ring memory : 10 days with 10-minute data sets

##### Power supply

- : 110/230 V 50/60 Hz, +10%/-15%

##### Power consumption

- : 15 VA plus 170 VA when the heating is on

##### Surroundings

- : Ambient temperature -50°C to +55°C  
insensitive to rain, freezing and air pollution  
highly stable against lightning and HF disturbances

##### Standardisation

- : CE mark

##### THYGAN EK33-G (transmitter)

- Weight : 8 kg
- Dimensions : 42 cm x 23 cm x 36 cm
- Construction : mechanically robust and not prone to corrosion

##### THYGAN EK33-St (control unit)

- Weight : 7 kg
- Dimensions : 33 cm x 23 cm x 11 cm
- Construction : mechanically robust and not prone to corrosion

# Fog and Frost Detection-System

## THYGAN EK33

DV.00678.4

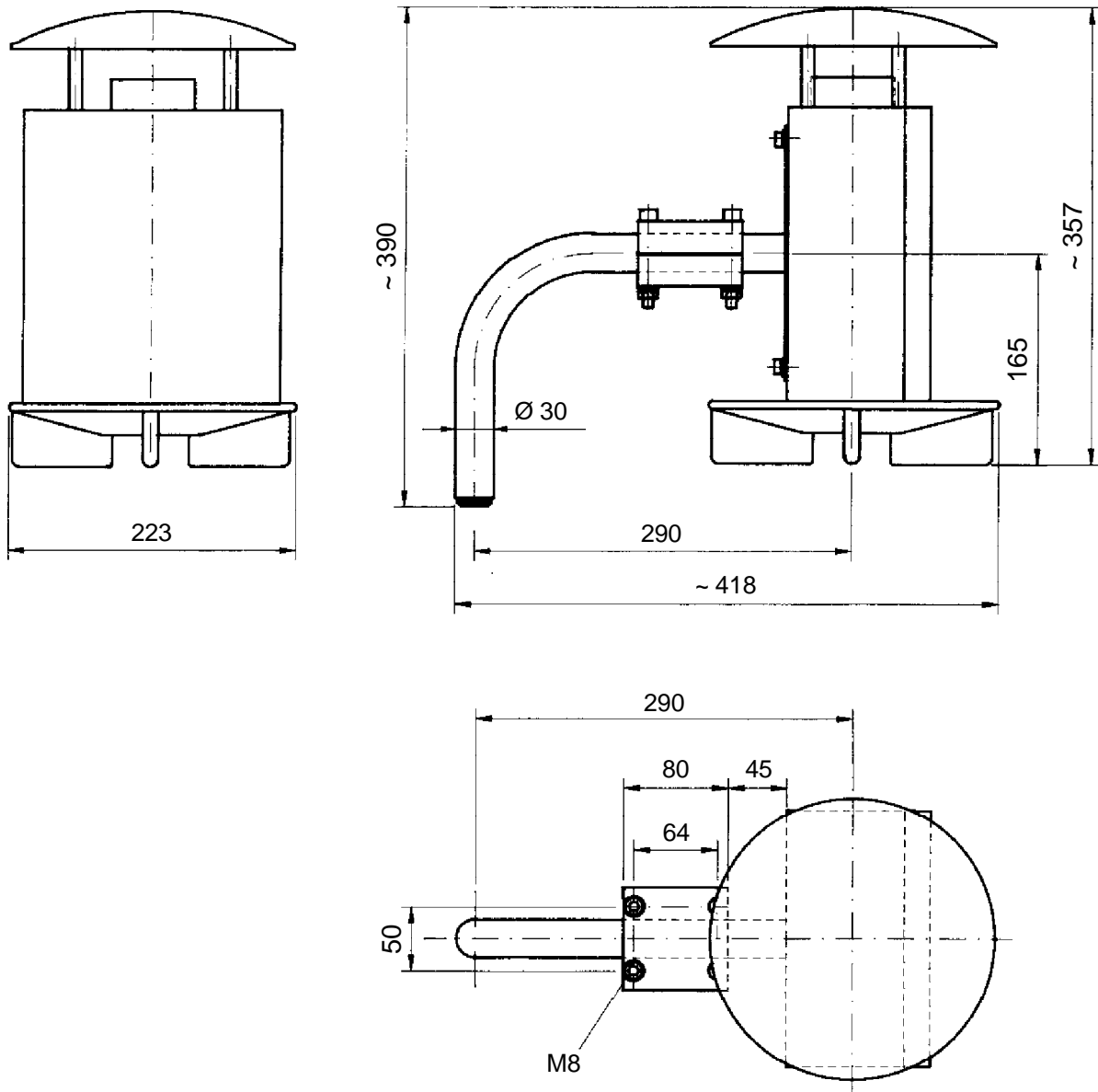
## Technical Specification

### SCOPE OF DELIVERY

1 THYGAN EK33 fog detection system, comprising:

- 1 THYGAN EK33-G transmitter
- 1 THYGAN EK33-St control unit
- 1 cable for connection terminals in the control unit and plug for the transmitter, 10 m long
- 1 insulating mounting bracket for the transmitter

### MECHANICAL DIMENSIONS



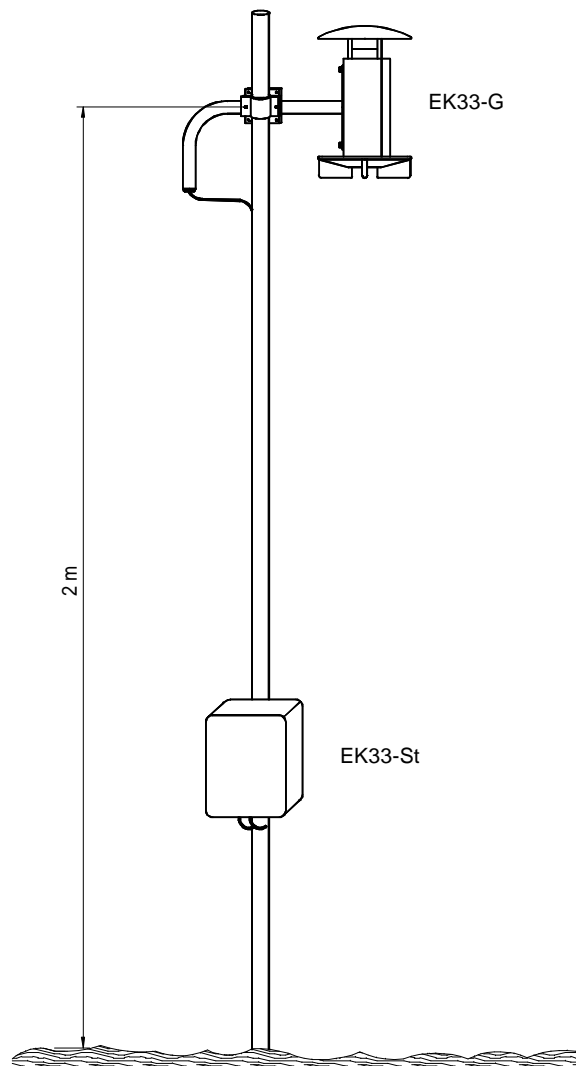
© by BOSCHUNG MECATRONIC / 12.1998 / E

### Technical Specification

DV.00678.4

#### MOUNTING EXAMPLE

---



© by BOSCHUNG MECA TRONIC / 12.1998 / E

#### FURTHER INFORMATION

---

Boschung Mecatronic AG  
Route d'Englisberg 21  
CH-1763 Granges-Paccot  
Tel. : +41 (0)26 460 44 11  
Fax : +41 (0)26 460 44 88  
e-mail: sales@boschung.com

Boschung Germany  
Boschung France  
Boschung USA  
Boschung GUS  
Boschung Austria  
Boschung China

Tel.: +49 (0)6252 99 410  
Tel.: +33 (0)325 03 07 32  
Tel.: +1 218 828 2012  
Tel.: +7 (0)95 956 46 48  
Tel.: +43 (0)1 911 81 68  
Tel.: +86 106 828 79 89

*Boschung Mecatronic reserves the right to substitute and/or change specifications  
without prior notice.*