5. Description of Monitor E1667

5.1. Display and Front side Operational Elements

5.1.1. Front View of Monitor E1667

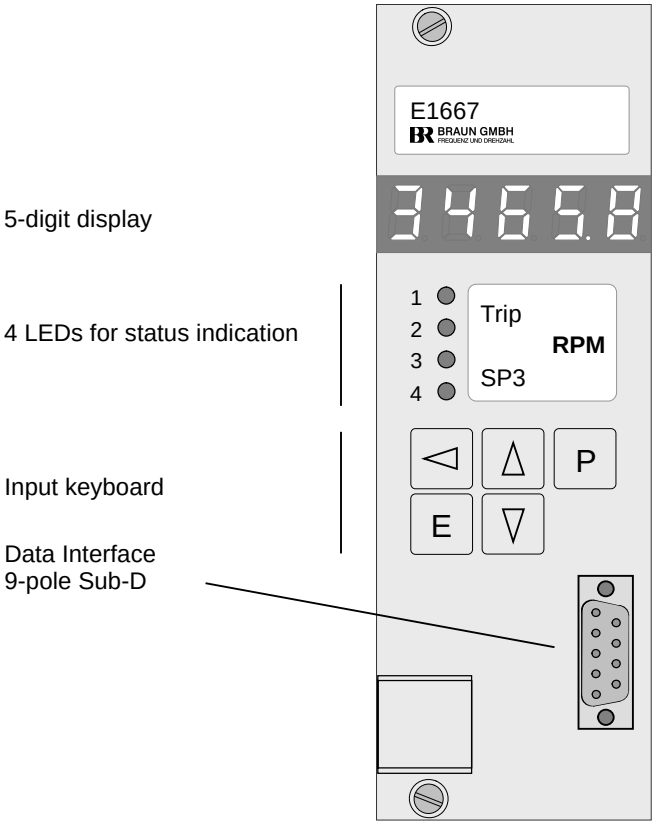

Figure 9: Front view of Monitor E1667

5.1.2. Status-LEDs

LED1	steady on:	Trip
LED2	steady on:	no Trip, SP1A is valid
	blinking:	SP1B is valid
LED3	steady on:	n < SP3
	blinking:	one only of three input channels measures zero speed
LED4	steady on:	n > SP3

5.1.3. Display during Test Procedures

FC-1 : Frequency generator tests Input "Forced Trip"
FC-3.1 : Trip-Line I is tested (relay I to Trip-Condition)
FC-3.2 : Trip-Line II is tested (relay II to Trip-Condition)
FC-3.4 : Trip-Line III is tested (relay III to Trip-Condition)

SELF : Monitor self-test

5.1.4. Values accessible during normal operation

Values accessible during normal operation (Standard Display Mode):

with key △ the value of SP1
with key ▽ the value of SP2
with key △ and E together: maximum stored speed value
with key ▽ and E together: minimum stored speed value

Note:

with key ◁ Reset of stored minimum/maximum value
with key ◁ and E together: Reset of latched (and not persistent) alarms, if enabled

with key △ and ▽ together: Toggle between Standard-Display Mode and Special Display Mode 1
with key △ and P together: Toggle between Standard-Display Mode and Special Display Mode 2

5.1.5. Display of Firmware release state and CRC-Parameter-Checksum of Monitor

with key P pressed longer as 5 seconds, the firmware release state and the CRC-Parameter-Checksum will be shown in a scrolled display:

A.0327 (firmware ID)
U._ _xx (xx = firmware version number)
D.uu_ _ (uu = year)
D._vv_ (vv = month)
D._ _ww (ww = day of firmware release state)
C.abcd (abcd = CRC-Parameter-Checksum)

5.1.6. Special Display Mode 1

Toggle between Standard and Special Display Mode 1 by pressing keys △ and ▽ together.
In Special Display Mode 1 the measured speed values of sensors A, B, C can be shown individually as well as the signal level of the main sensor.
Toggle between the four values with E .
The LED assigned to the specific speed value is blinking (see table).

with Monitor	LED assigned to			
	speed value of sensor: LED1	LED2	LED3	actual signal input level (in xx.x volts): LED4
A	A	C	B	A
B	B	A	C	B
C	C	B	A	C

5.1.7. Special Display Mode 2

Toggle between Standard and Special Display Mode 2 by pressing keys △ and P together.

In Special Display Mode 2, LED1 and LED4 are blinking.
This display mode is only used for trouble shooting, if external signals are missing and the Monitor displays the event code E.0.4.0.0 .

5.1.8. Front side Reset of Alarms and Event Codes

Resetting of (no longer valid) alarms and event codes is done by pressing keys E and ◁ (if enabled in step P00.02).

5.1.9. Data Interface

9pole Sub-D for PROFIBUS and RS232.

Note:
For RS232, adapter L3D02 or cable L3D05 must be used

5.2. Functions of Monitor E1667

For a detailed description of the individual functions refer to chapter 8.

5.2.1. Speed Measurement

Each Monitor receives the signal from the three sensors and calculates the speed from each signal. For the further evaluation it selects (depending on parameter settings) the calculated speed value derived of its own sensor or the median value of all three speed values.
Speed calculation is done by measuring the time in between the pulses. The minimum measurement time is 5 milliseconds.
To compensate for an imperfect gear, a predivider may be introduced to reduce the signal frequency to 1 pulse per revolution.

5.2.2. Functions for Overspeed Protection

Overspeed protection is done by:

- Monitoring of Sensors
- Monitoring versus Lowspeed as protection versus incorrect mounting or fault of speed sensors.
- Monitoring versus overspeed

5.2.3. Functions for External Trip by Voters

Trip is released, if one of the voters detects an external trip condition.
Voters may be configured as 1oo2, 2oo2, 2oo3 or 3oo3. High or low Input-Level as trip condition and response time is selectable.

5.2.4. Self-test of Monitor

Self-test is performed at an interval of approx. 2 hours. Execution of the Self-test is signalized on display with message SELF. Self-tests of the Monitors are inhibited versus each other.
The Self-test routine includes

- CPU RAM-Test
- CPU EEPROM-Test
- CPU Command-Test
- CPU Register-Test
- Voter Signal-input-Test

If the Self-test detects a malfunction, the monitor is set to trip-status.