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Operating instructions No. 607 E

FT 2000 Speed monitoring system

Sensor monitor FTU 2041

The sensor monitoring has three inputs for the connection of speed sensors with integral amplifier and a fourth input for connecting a test or check-back frequency. It is used for continuously checking the sensor circuits for open or short circuits and according to the programming the automatic transfer of the highest of the four input frequencies to the frequency output or of the chosen input- and test frequency. The failure of one of the three sensors is signalled individually, also when 1 or 2 of 3 sensors has failed.

Failure criteria:
- Current consumption too high or too low (static).
- Signal frequency 5% lower than the highest of the 3 input frequencies (dynamic, ie. evaluation only with sensor frequencies above 1 Hz).

In the case of the connection to the frequency output of a frequency relay functioning on the period or cycle measuring principle, it must be noted that the failure of a sensor can result in the loss of a period of the output frequency, causing the output frequency to fall during a period to half its actual value. Undesirable changeover of the frequency relay can be prevented by selecting a sufficiently large hysteresis with the limit.

Technical data:
Dimensions: 19" rack mounting module, Europa card size
Height: 3 units = 132.5 mm
Width: 4 units = 20.32 mm
Frequency inputs:
- Sensors
  3 potential-free inputs with common reference potential. Dielectric strength 500 V, 50 Hz in respect to protective earth, ie. to front panel and rack frame.
  Sensor supply 12 V=, 3 x 25 mA or 1 x 75 mA for sensors with a supply current consumption of 5...25 mA. The sensor in question will be signalled as defective in the case of values outside these limits. All frequency inputs are DC-coupled for rectangular pulses up to 30 kHz:
  V high > +10 Vp resp. I sink < 0.5 mA
  V low < + 5 Vp resp. I sink > 5 mA
- Test
  1 input, potential-free and with reference potential **isolated** from the three sensor inputs, without sensor supply.
  The test input is DC-coupled and for rectangular pulses up to 30 kHz:
  V high > +10 Vp resp. I sink > 5 mA
  V low < + 1 Vp resp. I sink < 0.5 mA

Binary inputs:

- 3 inputs (T1,T2,T3) for the gating of **one** of the three input signals for functionally checking the sensor monitoring.
  Three keys ($\overline{S1}$,$\overline{S2}$,$\overline{S3}$) on the front panel permit the manual initiation of the same function.
  Jumper 2: (from serial No. 9303400)
  Position 1: The binary inputs T1, T2, T3 and keys $\overline{S1}$, $\overline{S2}$, $\overline{S3}$ are inactive.
  Position2: The binary inputs T1, T2, T3 and keys $\overline{S1}$, $\overline{S2}$, $\overline{S3}$ are active.
  Jumper 3: (from serial No. 9303400)
  Position 1: Only the failure messages M1 and M2 are being considered in case of an alarm M4 (1 of 2, 2 of 2, see switch S5).
  Position 2: The failure messages M1, M2 and M3 are being considered in case of an alarm M4 (1 of 3 or 2 of 3, according to switch S5).
- 1 input (T4) for switching the test frequency directly through to the frequency output.
  The same function can be initiated by inserting a test plug in the front panel.
- 1 reset input for the collective alarm
  electrical data for the binary inputs:
  Input active low : Isink = 1 mA
  Input high: U > +3.5 V or open

Binary outputs:

- 3 fault signal outputs M1, M2 and M3 for individual sensor faults.
  Switch S1, S2 and S3:
  Position 1 activates the static control of the corresponding sensor 1, 2 or 3.
  Position 2 suppresses the short circuit and the no load control of the sensor power supply 1, 2 or 3.
  Switch S4:
  Position 1 is for self-holding and requires an external reset after a tripping.
  Position 2 signals a failure only as long as a fault is being detected.
- 1 alarm signal output M4 for the optional programmable 1 of 3 or 2 of 3 fault signal.
  All binary outputs open collector, switching to the negative pole, max. 100 mA, 30 V, short circuit-proof.
  1 relay output (K), permanently assigned to the alarm signal output (M4,) 1 changeover contact, max. 250 V, 1 A, 50 W. In case of inductive load, external spark suppression must be provided!
  Switch S5:
  On position 1 the alarm relay will be triggered by one failure on any of the 3 channels.
  On position 2 the alarm message output (M4) and the relay will only be activated if failures occur simultaneously on 2 of 3 resp. 2 of 2 channels.
  Four green **LED's** (M1,M2,M3,M4) **LIGHT** when the corresponding binary outputs are **NOT** activated (ie. when all three sensor circuits are serviceable), consequently all outputs M1 to M4 are active low, ie. low resistance.,

Frequency output:
Jumper 1: (from serial No. 9303400)
Position F1: Output frequency = highest frequency of sensor 1 and test frequency.
Position F2: Output frequency = highest frequency of sensor 2 and test frequency.
Position F3: Output frequency = highest frequency of sensor 3 and test frequency.
Position Fx: Output frequency = highest frequency of the 4 input frequencies (sensor 1,2,3,test).
Rectangular pulse with an amplitude of at least +10 Vs, output impedance 100 ohm. One of the four yellow LED's (S1,S2,S3,S4) designates a signal input currently switched through to the frequency output.
The binary inputs, open collector outputs and the frequency output have the negative pole of the supply voltage as a common reference potential.

Auxiliary power: Direct current supply 18...33 V, 1.8 W, max. 2.4 W. The supply voltage is chopped via a primary chopper regulator and transformed isolated to the required level.

Protection against loss of supply:
Supply voltage interruptions of up to 50 ms are bridged without malfunction.

Interference immunity:		Supply circuits	Input and output circuits
IEC 255-4	common mode:	2.5 kVs	2.8 kVs
	series mode:	1.0 kVs	--
IEC 801-4	common mode:	2.0 kVs	1.0 kVs

Ambient temperature: 0...+60°C, + 70°C during max. 2 hours.
Storage temperature: -20...+85°C

Aend.Nr. 5110 March 1993

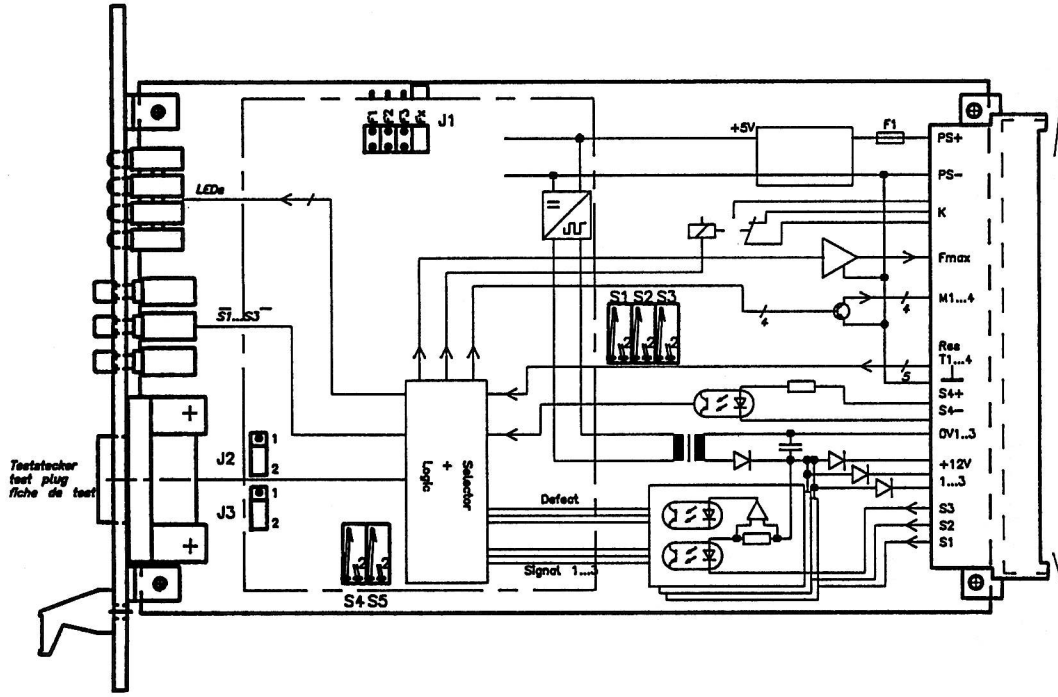
FT 2000

Anschlussschema
Connection diagram
Schéma de raccordement

FTU 2041

Geberüberwachung
Sensor monitor
Surveillance de capteurs

373Z–03419
373Z–03505 verdrahtet



Aendg.Nr. 5110
ab Fabrikations Nr.
from serial no. 93 03 400
à partir du no. de fabr.

F1 : 250mAT

Massbild
Dimensions 3–110.544/2
Côtés

d b z

PS+	2	Hilfsenergie Pluspol (+) / Power supply plus terminal (+) / Alimentation pôle positif (+)
PS–	4	Hilfsenergie Minuspol (–) / Power supply minus terminal (+) / Alimentation pôle négatif (+)
PE	6	Schutzleiter / Protectiv Earth / Conducteur de protection
K	8 / 10	Relais (1 U) / Relay (1 CO) / Relais (1 Inv.)
PE	12	Schutzleiter / Protectiv Earth / Conducteur de protection
Res Fmax	14	d Rücksetzeingang / Reset input / Entrée de mise à zero b — z Frequenzausgang / Frequency output / Sortie de fréquence
T4 M4	16	d Testfrequenz EIN / Test frequency ON / Frequence de contrôle ENCL. b — z Meldeausgang 2v3 defekt / Message output 2 out of 3 failed / Sortie de message 2 sur 3 défectueux
T3 M3	18	d Geber 3 AUS / Transmitter 3 OFF / Transmetteur 3 DECL. b — z Meldeausgang G3 defekt / Message output G3 failed / Sortie de message G3 défectueux
T2 M2	20	d Geber 2 AUS / Transmitter 2 OFF / Transmetteur 2 DECL. b — z Meldeausgang G2 defekt / Message output G2 failed / Sortie de message G2 défectueux
T1 M1	22	d Geber 1 AUS / Transmitter 1 OFF / Transmetteur 1 DECL. b — z Meldeausgang G1 defekt / Message output G1 failed / Sortie de message G1 défectueux
⊥	24	⊥
S4+ S4–	26	d ⎍ S4+ Testfrequenz / Test frequency / Fréquence de contrôle b — z ⎍ S4– Testfrequenz / Test frequency / Fréquence de contrôle
S3 +V3 0V3	28	d ⎍ S3 Signal 3 b +12V3 z 0V3
S2 0V2 +V2	30	d ⎍ S2 Signal 2 b 0V2 z +12V2
S1 +V1 0V1	32	d ⎍ S1 Signal 1 b +12V1 z 0V1

FT 2000 – FTU 2041

5246 13.7.95 Wa./Ko.
Aenderungen: 5110 17.2.93 STA

Sach–Nr. 373

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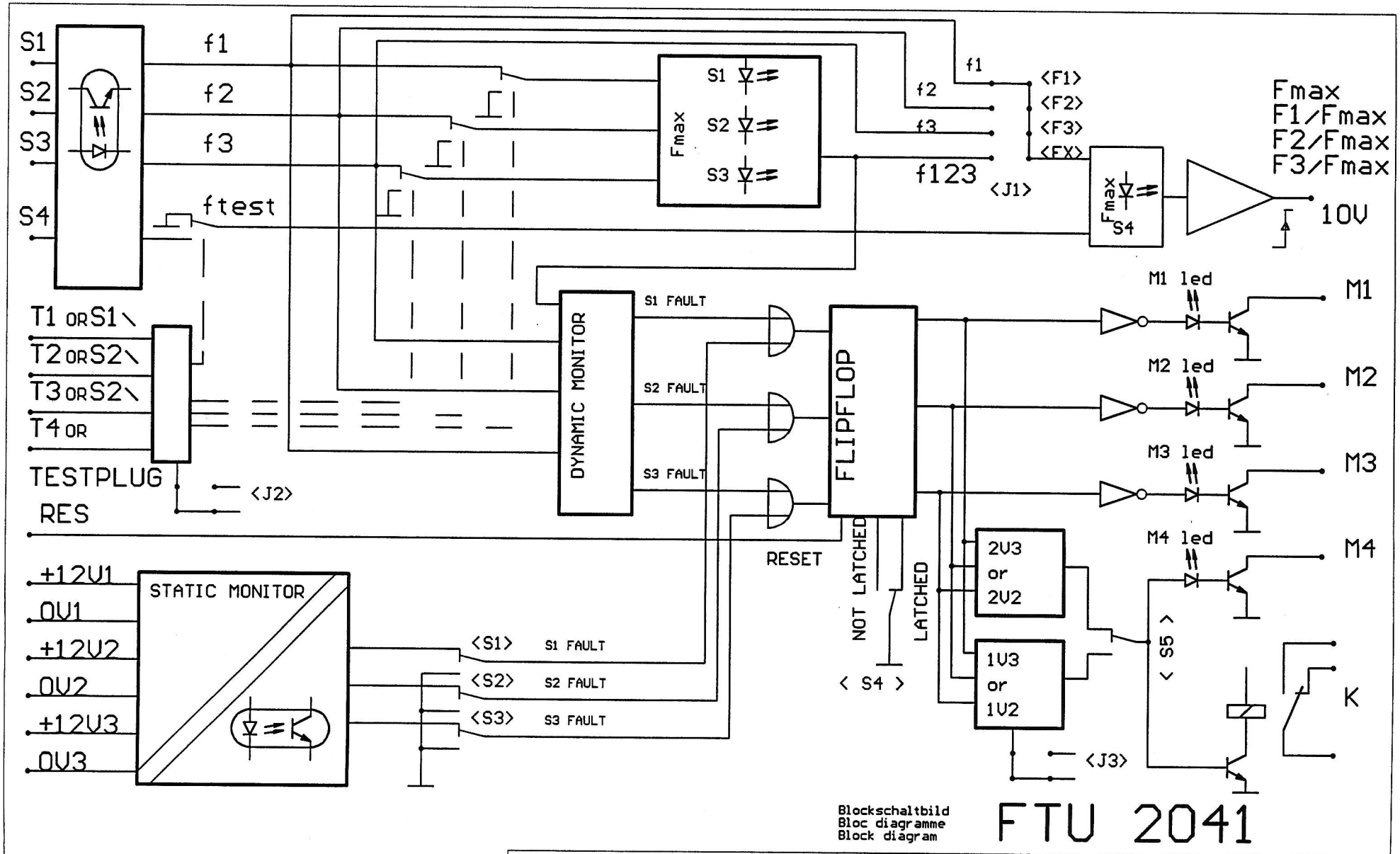
PLC S7



Blockschaltbild
Bloc diagramme
Block diagram

FTU 2041

Dateiname: BLFTU41A
Datum: 10.02.1993 12,01,58
Visum: Z-INFO
Plotdatum: 10.02.1993 12,03,43

Aenderung: 5110 21.10.92 scho

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Datum 21.10.92
Visum SCHO

4-110.714/5 1/1