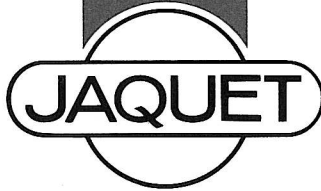


Swiss Made



JAQUET LTD
Thannerstrasse 15
CH-4009 Basle
Tel. +41 61 306 88 22
Fax +41 61 306 88 18



Operating instructions No. 602 E
FT 2000 Speed monitoring system
Frequency relay FTF 2024

The frequency relay serves for monitoring a frequency proportional to a measured value (i.e. rpm).

The module is microprocessor-controlled and operates on the period measuring principle with subsequent computing of the reciprocal value (computing principle). The frequency is measured continuously. The number of cycles considered for a measurement period is dependent on the level of the input frequency and on the limits to be monitored.

After the input of a machine factor

$$M = f/n$$

with $f(\text{Hz})$ = signal frequency of the sensor at
at a determined machine speed
and $n(\text{rpm})$ = machine speed

The limits for the frequency relay can be entered directly in rpm. For the limits, the switch-on point (limit high) and the switch-off point (limit low) can be put in separately, to permit the realisation of practically any hysteresis.

Input of parameters

The input or changing of all measuring parameters takes place via a separate handheld **micro terminal FTM 2000**, which can be plugged in to the front, with programming keys and a liquid crystal display. A matrix diagram (refer to drawing 4-110.664/1 allows a fast input of the parameters.

Technical data:

Dimensions: 19" rack mounting module, Europa card size

Height: 3 units = 132.5 mm

Width: 4 units = 20.32 mm

Accuracy: 0.2 % according to DIN/VDE 0410

Resolution of the limit input better than 0.1 %.

Temperature drift: max. 150 ppm/°K (frequency measurement)

Frequency range: 0.05 Hz to 30 kHz

It can be exceeded for any duration up to 50 kHz without disturbing the function.

Frequency input:

Sensor (S1), potential-free input, 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

Sensor power supply: +12 V, 25 mA

Dielectric strength 500 V, 50 Hz against earth (front panel and rack).

Test (S2), potential-free input, DC-coupled 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

Dielectric strength 500 V, 50 Hz against earth (front panel and rack).

An external frequency source may be electronically switched on the test frequency entry by means of a test key.

Binary inputs: (see drawing no. 4-110.714/1):

3 inputs (B1,B2,B3) for

- Startup bridging (the alarm triggered by the lowest limit is being suppressed for a startup time programmable from 0.0 to 999.9 s after short circuiting the binary input B1).
- Implicit sensor monitoring (sensor is ok when the lowest limit is exceeded, ie. the binary input B2 is short circuited to the negative pole via the relevant limit output, otherwise an alarm signal is activated).
- Startup monitoring (an alarm is activated during the startupbridging, when the lowest limit is NOT yet exceeded AND the binary input B3 is short circuited).

1 reset input

for the collective alarm and the limit outputs (after switching on the power or the triggering of an alarm due to the startup monitoring, the implicit sensor monitoring or the integrated microprocessor test, the reset input must be briefly short circuited to the negative pole).

The alarm triggering from the binary inputs can be delayed from 0.0 to 999.9 s.

The factory setting for the startup bridging is 10.0s and the alarm delay is 0.0 s. The delay time may be changed with the microterminal FTM 2000.

The corresponding time counter is being reset if the input state of an alarm function changes after the start of the delay time.

Binary inputs active low: I sink = 1 mA

Binary inputs high: U > + 3.5 V or open

Binary outputs:

8 limit outputs (G1...G8), open collector, switching to the negative pole, max. 100 mA, 3 V, short circuit-proof.

The function (limit mode) is "normal" or "inverse" and the status, limit status) is programmable "on" or "off":

- with "normal" and "on", exceeding the upper limit causes the corresponding output to be active low, i.e. low resistance, and falling below the lower limit renders the output high resistance.
- with "off" the corresponding limit output is always high resistance.

A green LED (LIMIT 1...8) on the front panel is on when the corresponding output is on low resistance. A collective alarm sets all eight limits on high resistance.

1 Relay output (K), 1 changing contact, max. 250 V, 1 A, 50 W. In case of inductive load, external spark suppression must be provided.

A collective alarm releases the relay.

The relay can additionally be freely assigned to the following state variables:

- limit 1
- limit 2
- etc.
- limit 8

The limit functions normal/inverse and on/off are also active here. With "normal" and "on" the exceeding of the upper limit is causing an attraction of the relay.

- failure (activated watchdog-timer OR broken fuse OR power failure)

A green LED (OK) on the front panel is on during normal operation.

The reaction time of the limit outputs is approx. 25 ms at an input frequency > 100 Hz.

The binary inputs and the open collector outputs have the negative pole of the supply voltage as a common reference potential.

Power Supply: 18...33 V DC, typ. 1.8 W/max. 3 W.

The supply voltage is stabilised at +5 V with a regulator and if necessary transformed potential free by means of oscillation transformers.

Protection against mains voltage failures:

Mains voltage failure bridged up to 50 ms 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

Nov. 1992

FT 2000

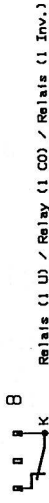
Anschlusschema
Connection diagram
Schéma de raccordement

FTF 2024

Frequenzrelais
Frequency relay
Relais de fréquence

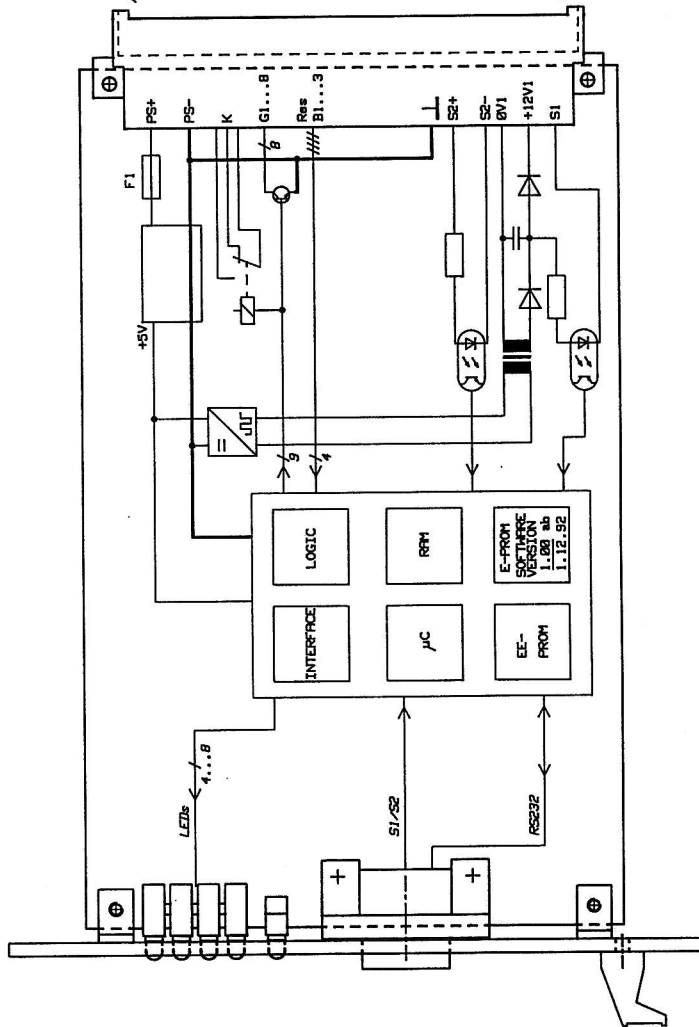
d b z

- PS+ 2 Hilfsenergie Pluspol (+) / Power supply plus terminal (+) / Alimentation pole positif (+)
- PS- 4 Hilfsenergie Minuspol (-) / Power supply minus terminal (-) / Alimentation pole négatif (-)
- PE 6 Schutzleiter / Protective Earth / Conducteur de protection



- Res 08 C4 Rücksetzgang / Reset input / Entrée de mise à zéro
- 0 0 0 b Grenzwertausgang 4 / Limit output 4 / Sortie de limite 4
- 0 0 0 z Grenzwertausgang 4 / Limit output 4 / Sortie de limite 4
- B8 07 C3 Binäreingang 3 / Binary input 3 / Entrée binaire 3
- 0 0 0 b Grenzwertausgang 7 / Limit output 7 / Sortie de limite 7
- 0 0 0 z Grenzwertausgang 3 / Limit output 3 / Sortie de limite 3
- B2 06 C2 Binäreingang 2 / Binary input 2 / Entrée binaire 2
- 0 0 0 d Grenzwertausgang 6 / Limit output 6 / Sortie de limite 6
- 0 0 0 z Grenzwertausgang 2 / Limit output 2 / Sortie de limite 2
- B1 05 G1 Binäreingang 1 / Binary input 1 / Entrée binaire 1
- 0 0 0 b Grenzwertausgang 5 / Limit output 5 / Sortie de limite 5
- 0 0 0 z Grenzwertausgang 1 / Limit output 1 / Sortie de limite 1

- 0 0 0 22
- 0 0 0 24 d z
- 0 0 0 26 d z
- 0 0 0 28
- 0 0 0 +12V1 d
- 0 0 0 +12V1 b
- 0 0 0 +12V1 z
- S1 0V1 d Signal 1
- 0 0 0 32 d
- 0 0 0 0V1 z



F1 : 160 mAT



FT 2000

Mikroterminal FTME 10

BO

Kunde :
Client:

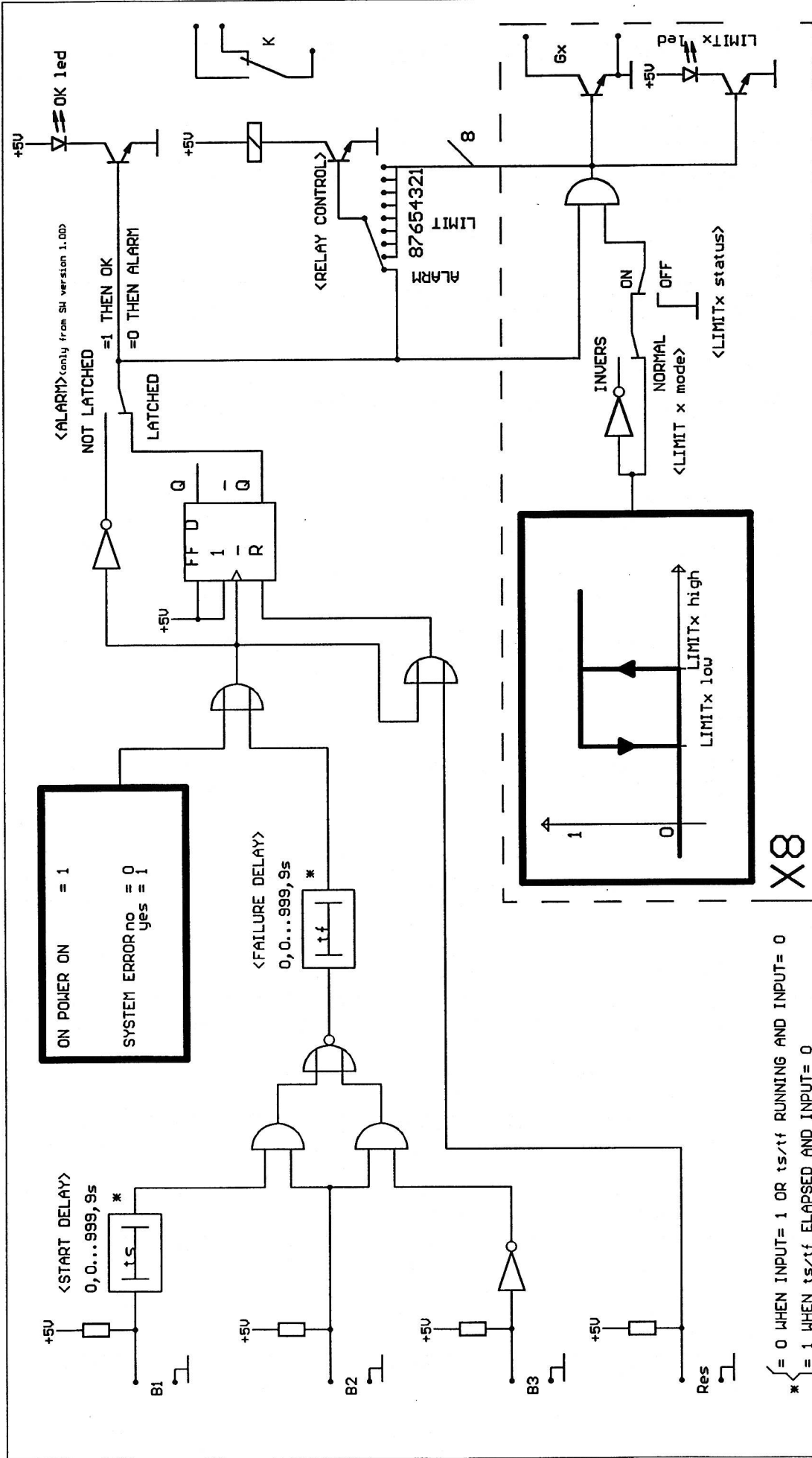
Konfigurationsblatt
Configuration sheet

Frequenzrelais
Frequency relay

FTF 2024

Rack/Zeile:.....,Steckplatz:.....
Rack/row place
Datum: Visum:

12				
11	X=0Y=11 XYMODE MIN.FREQUENCY	X=1Y=11 XYMODE ALARM	X=2Y=11 XYMODE NOT USED	X=3Y=11 XYMODE NOT USED
	.002Hz/.005Hz/.01Hz/.02Hz .05Hz/.1Hz/.2Hz/.5Hz/1Hz	Latched/Not latched		
10	X=0Y=10 XYMODE NOT USED	X=1Y=10 XYMODE NOT USED	X=2Y=10 XYMODE NOT USED	X=3Y=10 XYMODE NOT USED
09	X=0Y=09 XYMODE RELAY CONTROL	X=1Y=09 XYMODE START DELAY	X=2Y=09 XYMODE FAILURE DELAY	X=3Y=09 XYMODE * SOFTWARE VERSION 1.00
	limit1/limit2/limit3/limit4 limit5/limit6/limit7/limit8 Alarm	000.0s	000.0s	
08	X=0Y=08 XYMODE LIMIT 8 low	X=1Y=08 XYMODE LIMIT 8 high	X=2Y=08 XYMODE LIMIT 8 mode	X=3Y=08 XYMODE LIMIT 8 status
	0.000E+00	0.000E+00	Normal/Invers	On/Off
07	X=0Y=07 XYMODE LIMIT 7 low	X=1Y=07 XYMODE LIMIT 7 high	X=2Y=07 XYMODE LIMIT 7 mode	X=3Y=07 XYMODE LIMIT 7 status
	0.000E+00	0.000E+00	Normal/Invers	On/Off
06	X=0Y=06 XYMODE LIMIT 6 low	X=1Y=06 XYMODE LIMIT 6 high	X=2Y=06 XYMODE LIMIT 6 mode	X=3Y=06 XYMODE LIMIT 6 status
	0.000E+00	0.000E+00	Normal/Invers	On/Off
05	X=0Y=05 XYMODE LIMIT 5 low	X=1Y=05 XYMODE LIMIT 5 high	X=2Y=05 XYMODE LIMIT 5 mode	X=3Y=05 XYMODE LIMIT 5 status
	0.000E+00	0.000E+00	Normal/Invers	On/Off
04	X=0Y=04 XYMODE LIMIT 4 low	X=1Y=04 XYMODE LIMIT 4 high	X=2Y=04 XYMODE LIMIT 4 mode	X=3Y=04 XYMODE LIMIT 4 status
	0.000E+00	0.000E+00	Normal/Invers	On/Off
03	X=0Y=03 XYMODE LIMIT 3 low	X=1Y=03 XYMODE LIMIT 3 high	X=2Y=03 XYMODE LIMIT 3 mode	X=3Y=03 XYMODE LIMIT 3 status
	0.000E+00	0.000E+00	Normal/Invers	
02	X=0Y=02 XYMODE LIMIT 2 low	X=1Y=02 XYMODE LIMIT 2 high	X=2Y=02 XYMODE LIMIT 2 mode	X=3Y=02 XYMODE LIMIT 2 status
	0.000E+00	0.000E+00	Normal/Invers	On/Off
01	X=0Y=01 XYMODE LIMIT 1 low	X=1Y=01 XYMODE LIMIT 1 high	X=2Y=01 XYMODE LIMIT 1 mode	X=3Y=01 XYMODE LIMIT 1 status
	0.000E+00	0.000E+00	Normal/Invers	On/Off
00	X=0Y=00 XYMODE * FTF 2024	X=1Y=00 XYMODE FIX TIME	X=2Y=00 XYMODE MACHINE FACTOR	X=3Y=00 XYMODE STORE ?
		0.01/0.03/0.07/0.15/0.30 0.60/1.20/2.40/4.80/9.60	0.000E+00	
Y				
X	0	1	2	3



FTF 2024/FTFW2022

Blockschaltbild
Block diagram
Bloc diagramme

Datum 01.10.92
Ursum SCHO

4-110.714/2 1/1

JAQUET AG
BASEL



RENDERUNG: 5109 22.10.92

Dateiname: BLTF-24
Datum: 26.10.1992 14, 44, 08
Ursum: Z-INFO
Plotdatum: 26.10.1992 14, 45, 07