• Characteristies

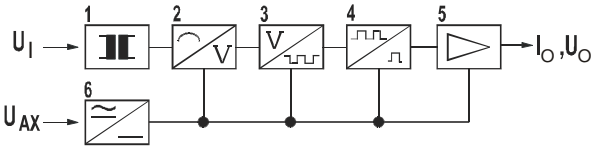
- Frequency measuring with crystal equipped circuit.
- Low error limit.
- Hight resolution.
- Output signal with or without suppressed zero.
- Galvanic isolation between in- and output and extern power supply.
- Reduced size for mouting space saving.
- Case type housing for fastening with screws, on rail.
- Output with load divider (optional).

• Application

Conversion of the frequency range of an input signal into a direct voltage or current, which is independent on the load.

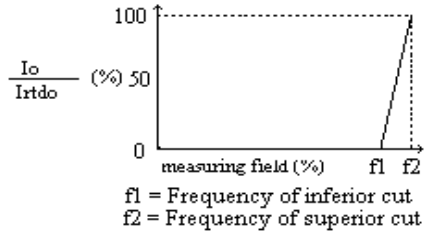
• Functioning

The transducer ETF-30 is a fully electronic instrument.



By means of the transformer (1), which effectuates a galvanic isolation between the in- and output signals, the input signal is sent to a pulse generator (2). The needle shaped pulses from this generator trig a counter (3) defining the number of pulses, which are supplied by a crystal oscillator. With the output voltage of the counter (3) and by means of a CMOS hey, the inputs of the subtracion module (4) are switched over in opposite direction between a reference voltage and ground..The result is a square wave signal, which is proportional to the measured frequency. The amplifier (5) converts the input signal in an output of alternating voltage or current. The power supply (6) feeds auxiliary power to all intern circuits with galvanic isolation from power net by means of a transformer.

Characteristic Curve



f1 = Frequency of inferior cut
f2 = Frequency of superior cut

Technical data (NBR 8145)

Input

Frequency	45...50...55Hz 48...50...52Hz 49...50...51Hz 55...60...65Hz 58...60...62Hz 59...60...61Hz 360...400...440Hz 384...400...416Hz 392...400...408Hz (others on consult)
Rated voltage •	Extern trigger 0...110/220/380/500V (others on consult)
Trigging range	0,2...1,5 U**rtdI** for extern trigger
Consumption	≤ ± 1mA
Overload	permanently: 1,5 U**rtdI** briefly: 4U**rtdI**/1s
Ground voltage	660V max. (IEC 348)

Output

Current	0...5/10/20mA 4...20mA (others on consult)
Signal limit	≤ 1,5 I**rtdO** ≤ 25V; R**C** = infinite
Load limit	Rc = 15.000(mV) / max. output signal (mA) Ω
Output with load divider (optional)	To calculate RC use 7.500mV instead of 15.000mV, the results will be the same for both outputs
Voltage	0...10V; RC ≥ 500 Ω (others on consult)
Residual ripple	≤ 0,5% (peak to peak) •

Auxiliary power supply

20…60Vca/Vcc or 85…265Vca/90…300Vcc
consumption: ± 4W

Influence magnitudes

Error limit • 0,5%(normal) or 0,25% (optional)

Reference conditions	Input:	U**I** = 0,2..1,2 U**rtdI**
	Form factos:	1,111
	Auxiliary power supply:	U**AX** ±2%
	Harmonics	< 5% of input signal
	Load:	0,5R**C** max.
	Ambient temperature:	25°C ±2K
	Heat up time:	± 20 min.

Additional error above 1,2IrtdI or UrtdI	≤ 0,2%
Linearity deviation	≤ 0,2% • (included in error limit)
Load	≤ 0,05% • R**C** = 0....R**C** max. (included in error limit)
Temperature	≤ 0,2% + (frtd •) x 0,015 / 10K; (f2 - f1) rated temperature 25°C
Auxiliary power supply	≤ 0,05% • within the permitted tolerance range for the supply voltage
Response time	≤ 200 ms •
External magnetic fields	≤ 0,5% • for field intensity of 0,4 kA/m
Radio frequency interference	≤ 0,5% • between 27...460MHz at a distance of 1m; power 1 W

Electrical test

Voltage test : U**AX** = 20… 60VDC = 1,5kV/1 min. 60Hz
Between auxiliary power supply and others
Voltage test : U**AX** = 85…265Vca/90…300Vcc = 2,5kV/1 min.
60Hz between auxliary power supply and others

Peak and transient protection	5kV; 1,2/50 us; 0,5Wo
High frequency interference	2,5kV; 1MHz; 400 pulses / 1s

Construction and Mounting

Type	**Case**
Housing	Base and cover of plastic
Fastening	Surface mounting with two screws M4, or using DIN rail.
Electrical connection	Frontal terminals for eye and fork type cable shoes
Protection class (NBR 6146)	IP 50 in housing IP 20 at the connection terminals
Weight	± 0,7 kg

Climatic conditions

Operation temperature	-20...+60°C
Functioning temperature	-25...+70°C
Transport and storage temperature	-40...+80°C
Relative humidity	≤ 75% of annual average with light condensation (others on consult)

Mechanical Test

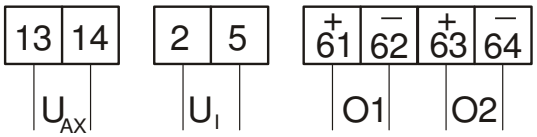
Impact	acceleration 30g during 11ms
Vibration	acceleration 2g frequency 5..150Hz

Notes:

- **Extern Trigger**: Measuring voltage ≠ power supply voltag; Measuring frequency ≠ power supply frequency
- Related to the end value of the output signal
- frtd = Rated frequency
  f1 = Lower cut frequency
  f2 = Upper cut frequency

- Response times below 200 ms result in bigger residual ripple.

Electrical Connection

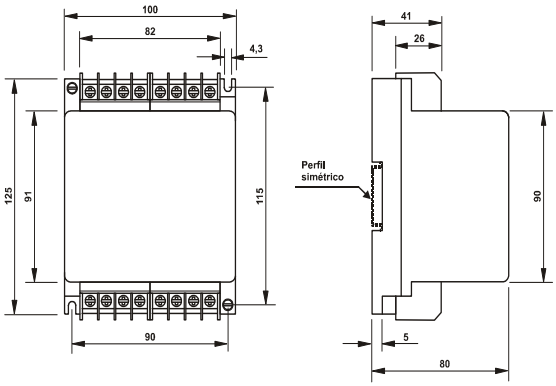


UAx = Auxiliary power supply
UE = Voltage input
- O1 = Current or voltage output - normal
- O2 = Output with load divider (double output) optional

Notes:
- When using only O2 jump terminals 61 and 62.
- When using “double output”, there is no galvanic isolation between the output signals.

Dimensional Drawing

Dimension in mm



For quoting and ordering please issue your order according to the specification text:

Example:
Transducer ETF-30

Housing :	Case
Measuring range:	55..60..65Hz
Rated voltagel:	0..220V Extern Trigger
Auxiliary power supply:	85…265Vca/90…300Vcc
Output Signal:	4...20mADC
Option:	Class 0,25%
Additional information:	Normal

Code number: N0031004213511

Additional information

The following items contain tips and cautions to be observed by the user for a good functional performance, as well as the maintenance of the instrument and the safety of the installations.

Cautions

Be sure the voltages and currents to be connected to the instrument, are compatible.
Loosen all connections from the instrument before removing it from the installation .

Mounting Instructions

Oserve the ambient temperature range. At the place of installation, values for vibration, dust, dirt and humidity, which must remain between the limits, established by the protection class of the housing and the climatic group, specified in this data sheet, have to be observed .
For fastening on flat area use two M4 screws. For mounting on DIN rail, use the snap-in device on the rear of the instrument.
The connections can be made with eye or fork type cable shoes.

Instructions for use

When connections have been made, switch on the power supply and check at the output the functioning of the transducer.

	Catalog number										
TRANSDUCER FOR FREQUENCY ETF-30	**N**	**0**	**0**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Housing												
Case						**0**						
Measuring range												
45... 50... 55Hz for output 4...20mADC							**01**					
48... 50... 52Hz for output 4...20mADC							**02**					
49... 50... 51Hz for output 4...20mADC							**03**					
55... 60... 65Hz for output 4...20mADC							**04**					
58... 60... 62Hz for output 4...20mADC							**05**					
59... 60... 61Hz for output 4...20mADC							**06**					
360...400...440Hz for output 4...20mADC							**07**					
384...400...416Hz for output 4...20mADC							**08**					
392...400...408Hz for output 4...20mADC							**09**					
45... 50... 55Hz for others output							**10**					
48... 50... 52Hz for others output							**11**					
49... 50... 51Hz for others output							**12**					
55... 60... 65Hz for others output							**13**					
58... 60... 62Hz for others output							**14**					
59... 60... 61Hz for others output							**15**					
360...400...440Hz for others output							**16**					
384...400...416Hz for others output							**17**					
392...400...408Hz for others output							**18**					
Others							**00**					
Rated Voltage												
Extern Trigger 110V (22... 165V)								**1**				
Extern Trigger 220V (44... 330V)								**2**				
Extern Trigger 380V (76... 570V)								**3**				
Extern Trigger 500V (100...750V)								**4**				
Others								**6**				
Auxiliary power supply												
20…60Vca/Vcc									**12**			
85…265Vca/90…300Vcc									**13**			
Output Signal												
0...1mADC										**1**		
0...5mADC										**2**		
0...10mADC										**3**		
0...20mADC										**4**		
4...20mADC										**5**		
0...10VDC										**6**		
Others(+/- 1mAdc, +/- 20mAdc, +/- 1Vdc and +/- 15Vdc)										**0**		
Option												
Error limit 0,25%											**1**	
Output with load divider (double output)											**2**	
Others response times between 50ms and 2s											**4**	
Standard (Class 0,5%)											**5**	
Additional Information												
Standard												**1**
Complement												**C**

Hartmann & Braun

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