



WP-LEQN Speed Monitoring Device OPERATING MANUAL

NO:LEQN240910EN

FUJIAN WIDE PLUS PRECISION INSTRUMENTS CO.,LTD

I. Technical performance

Input signal: ① Fp: fluted plate pulse of alternator (3lines); ② Fm:AC residual pressure; Two signals can be input at the same time and Fp is prior.

Input range: fluted plate pulse:0.5~1 kHz, DC 24V; AC residual pressure: 0.5~100 Hz, 0.2~250V.

Display content: general indication: frequency or percentage of input signal;
parameter indication: operating points set for each relay or other parameter setting values (refer to parameter list).

Output contactor: J1~J9 normally open contactor, 5A/250V AC, 5A/30V DC.

Current output: 4~20mA, corresponding to frequency of signals.

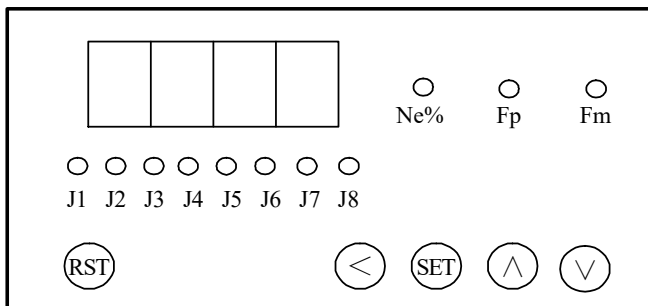
Working environment: 0~50℃, humidity $\leq 85\%$.

Dimension: 160×80×150mm (L×H×D).

Power supply for working: 85~265V AC or 100~300V DC.

Instrument consumption: $\leq 5W$.

II. Introduction to instrument' s panel



- 1) Digital tubes (4 tubes): display rotation speed in percentage form / frequency / parameter values ;
- 2) Indicating lights (J1~J8): state of each relay: on: relay is connected ;

- 3) Indicating light Ne%: on: display rotation speed in percentage form; off: display rotation speed in frequency form ;
- 4) Indicating light Fp: on: current rotation speed is controlled by fluted plate input ;
- 5) Indicating light Fm: on: current rotation speed is controlled by residual pressure input ;
- 6) Button(5 buttons): refer to Instrument Operating Instruction to know how to operate them

Parameter Instruction:

Parameters of the instrument (11 in all) display as follows:

No.	Meaning	Setting range	Factory setting	Remarks
1	Setting values of J1 action	1~5%	1.005	If measured values are lower than setting values, J1 is connected.
2	Setting values of J2 action	10~100%	2.030	If measured values are lower than setting values, J2 is connected.
3	Setting values of J3 action	10~100%	3.070	If measured values are lower than setting values, J3 is connected.
4	Setting values of J4 action	10~100%	4.090	If measured values are lower than setting values, J4 is connected.
5	Setting values of J5 action	10~180%	5.110	If measured values are higher than setting values, J5 is connected.
6	Setting values of J6 action	10~180%	6.120	If measured values are higher than setting values, J6 is connected.
7	Setting values of J7 action	10~180%	7.130	If measured values are higher than setting values, J7 is connected.
8	Setting values of J8 action	100~180%	8.140	If measured values are higher than setting values, J8 is connected.
9	To set menu password	0~255	9.001	If password is right, users can enter the parameter setting menu.

10	To set teeth number of fluted plate	1~100	A.020	Only fluted plate input signal is valid.
11	To set the number of electrodes	1~60	B.002	Only fluted plate input signal is valid.

III. Instrument Operating Instruction

- 1) Connected to power supply, the instrument will show SH-1 and then search for fluted plate signal input (Fp) and residual pressure signal input (Fm) automatically.

About 5 seconds later, the instrument will enter a state that displays frequency of fluted plate: NE% indicating light is off; Fp on; Fm off.

Relays work according to fluted plate signal if it is normal (that is, it is not equal to zero).

If fluted plate signal is zero while residual pressure signal not, the instrument displays frequency of residual pressure and relays work according to residual pressure signal.

If two signals are both zero, the instrument shows 00.00, Fp (fluted plate) indicating light is on and J1~J4 relays are connected (corresponding indicating lights are on).

- 2) Once fluted plate signal is normal, the instrument returns back to display frequency of fluted plate and relays are controlled by fluted plate signal automatically.
- 3) Press button <, Ne% indicating light will be on and the instrument displays frequency of current input signal in percentage form which is divided by center frequency (50Hz).

Press button < again, Ne% indicating light will be off and the instrument displays frequency value of current input signal.

- 4) When the instrument displays measured values, press button ∇ , instrument will show another input signal; press ∇ again, instrument

returns to show original signal. If users don't press $\vee$ again, instrument will return to show original input signal automatically after about 5 seconds. Pressing $\vee$ only changes to display different input signals and has no impact on actions of relays.

- 5) Instrument unconnected to power supply, relay 9 is connected. Once instrument connected to power supply, relay 9 remains unconnected immediately.
- 6) Function of button RST is to let instrument start new working state and have relay 9 connected once. Don't press it unless instrument is crashed.
- 7) Press button SET, the instrument will show P.000, guiding users to enter correct password. Users can modify password by pressing $\wedge$ or $\vee$. If password entered is right, press SET again, instrument will enter setting menu and show first parameter 1.005. Users can modify each parameter through $\wedge$ or $\vee$ or can also press button SET to check each parameter instead of modifying it. If password entered is wrong, press SET to return to display measured values.
- 8) When modifying parameters, users can press $\wedge$ or $\vee$ and hold on to add or subtract values of parameters continuously. After number in ones place add or subtract values ten times continuously, number in tens place, automatically, will add or subtract values continuously. If users release $\wedge$ or $\vee$ and then press it again, instrument will act anew like progress above.
- 9) If value of a parameter reaches the range that has set, instrument will restrict operation to add or subtract values, so values of parameters will not go beyond the range.
- 10) In order to operate the instrument conveniently, after entering the parameters modifying menu, users can check each parameter in normal order by pressing button SET or in reverse order by pressing button $<$. Once users check the last (or the first) parameter and press SET (or $<$) again, instrument will exit the menu and return to display measured values.
- 11) Current output of the instrument is always corresponding to current frequency of input signal: 0Hz is corresponding to 4mA; 50Hz, 12mA; 100Hz, 20mA.

12) To avoid the situation that relays act repeatedly at a certain frequency, the instrument will add frequency hysteresis ($\pm 1.0\text{Hz}$) automatically.

13) Teeth number of fluted plate and how much pairs of electrodes that motor has should be decided according to practical situation of fluted plate and motor. If necessary, please ensure parameters of fluted plate that have set are right according to frequencies of residual pressure signal and fluted plate signal which are showed in screen. If parameters of fluted plate are set correctly, frequencies of two signals should be the same. Formula to calculate frequency of fluted plate signal: $f(\text{Hz}) = (N \times B \times a) / (60 \times A)$ Hz

Ps: N: rotation speed of motor(r/min)

A: teeth number that has set

B: number of electrode pairs that has set

a: actual teeth number

14) 24V terminal is not only the positive terminal of current output, but also power supply terminal of pulse input (3 lines).

15) Terminals of Instrument (back view)

	Working power supply			Relays 9		Limit relays J (8～5)							
	L	N	G	J9	J9	J8	J8	J7	J7	J6	J6	J5	J5
Blue			Black (near switch, 3 lines)					Brown					
Fp-	Fp+	Fm-	Fm+	I0-	24V	J4	J4	J3	J3	J2	J2	J1	J1
Fluted plate frequency		Residual pressure frequency		Current output		The lower limit relays (4～1)							

IV. Delay Caused by Actions of Relays

1) Instrument connected to power supply for the first time, relays' actions have 5 seconds delay.

2) There is 2.5 seconds delay for sudden change of frequency which is beyond

2.5 Hz.

- 3) Instrument will do smoothing filtering to frequency change which is within 2.5 Hz and the filter period is 5 seconds.
- 4) If input frequency is beyond 100 Hz, the instrument has 2.5 seconds delay.
- 5) There are 5 seconds to return automatically to display residual pressure signal.
- 6) Delay for automatic switch of two signals:

Fluted plate signal	Residual pressure signal	Switch action	Delay
nonzero→zero	nonzero	Fp→Fm	7.5s
zero→nonzero	nonzero	Fp→Fm	7.5s
nonzero→zero	zero	Fp	No delay
zero→nonzero	zero	Fp	No delay
zero	nonzero→zero	Fm→Fp	7.5s
zero	zero→nonzero	Fp→Fm	2.5s
nonzero	nonzero→zero	Fp	No delay
nonzero	zero→nonzero	Fp	No delay

V. Attention

- 1) Connection mode to input signals to approach switch : blue line is connected to (FP-); black line is connected to (FP+); brown line is connected to (24V) .

Once connection is wrong, approach switch will be broken. Do be pay attention to it.

After approach switch is connected correctly, users should test it firstly: Supplying power to instrument, you have some iron objects such as screwdriver get close to head of approach switch, red light on its side will be on and removed, light off.

The best distance between approach switch and fluted plate should be 2mm to 4mm; if they are too close, approach switch may be broken; if too far, signals are not stable.

- 2) There is no need to provide external power source when using the instrument's function of current output because there is 24V power source inside the instrument. What users should do is to connect '24V' and 'I0-' to load directly.
- 3) There must be signals input to instrument's input terminals. Short-circuit input terminals if they are not being used; don't let them hang in the air (causing interference); do not connect them in parallel!
- 4) When both signals are effective, the instrument preferentially selects the gear disk signal.



Wide Plus

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