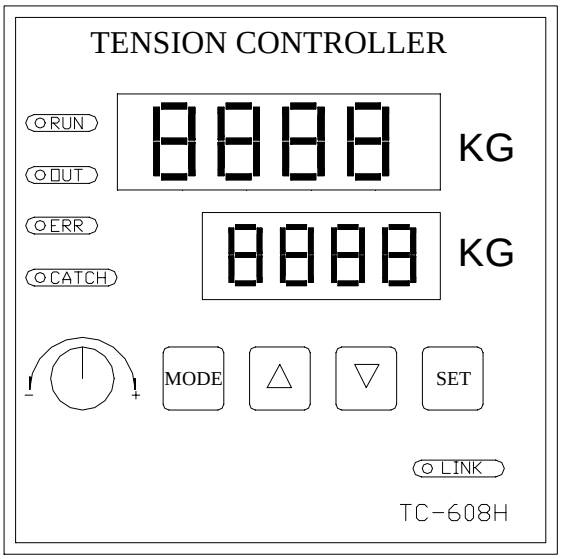
Tension Controller - Feedback System

TC-608H Control Panel

(In the Form of a Load Cell)

(Built-In Communication Function)

User Manual



Contents

Foreword

Many thanks for choosing TC-608H Feedback-System Tension Controller (hereinafter referred to as 608H.)

Read this user manual before using to take full advantage of 608H and for users' safety. The manual tells you how to do the wiring, setting parameters and detect abnormalities and deal with them. Keep the manual for future reference.

Contact us in the event of questions to which answers cannot be found in the manual. We will do our utmost to offer you satisfactory solutions. Your comments are welcome anytime.

1. Attention:

- No wiring and removing/installing connector of 608H when the power is on.
- Terminals of 608H are contacts of feedback and output signals. Do not use them for other purposes.
- Do not connect the output terminal of 608H to AC power or allow alien voltage to enter.
- Do not remove the casing and conduct pressure-endurance tests on components.
- Make sure the power input into terminals 1 and 2 to be AC 220V ±10%.

2. Principles

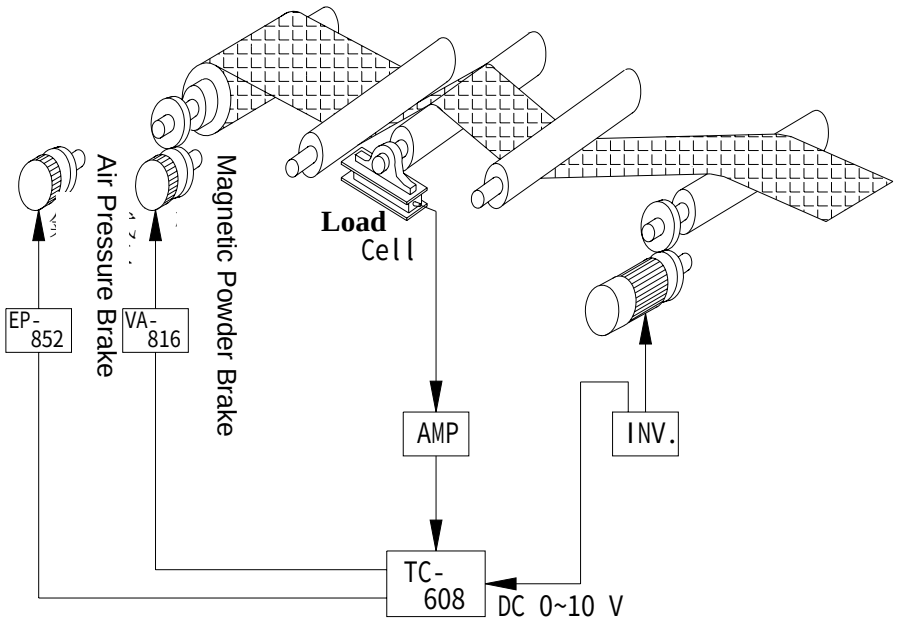
The controller sets the material put-in and roll-up and the tension value required according to the actual production conditions. 608H adjusts the output command after comparing the settings with the value detected and returned by the Load Cell in order to change the braking force or the roll-up torque, automatically setting the actual tension to the preset tension, a high-precision tension control system.

3. Features:

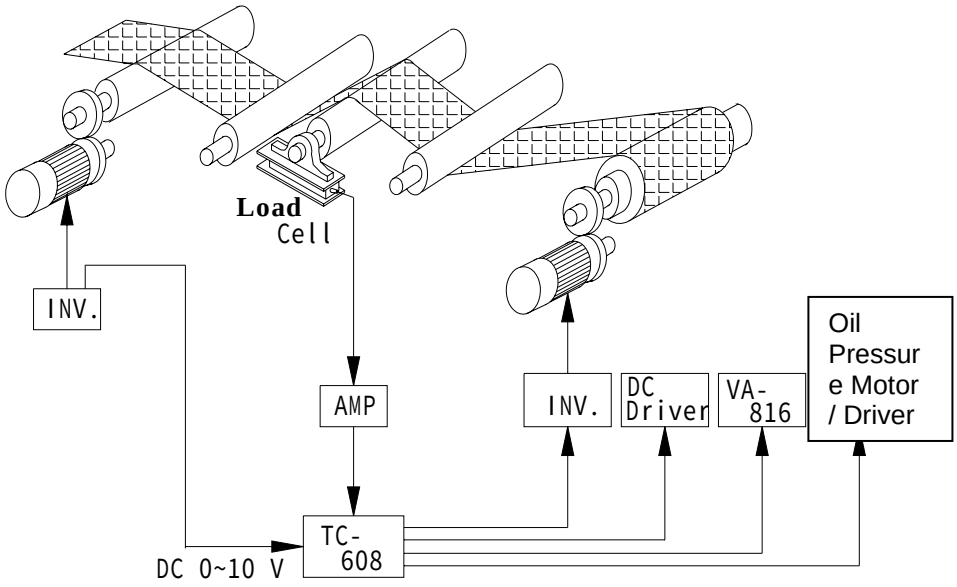
- high precision, high reliability
- tension value may be set at: kg / N / LB by the user
- digital design, unchanged characteristic
- humanistic design, easy to operate
- output command multi-functional display including preset and actual tension values
- external auxiliary tension diminishing function
- parameter power outage memory function
- able to initiate augmentative function, able to compensate static friction arising from initiating machine
- tension reduction function at shutdown eliminates excessive tension
- RS-485 communication interface enables communication with PLC and PC

4. Application Flow

Put-in

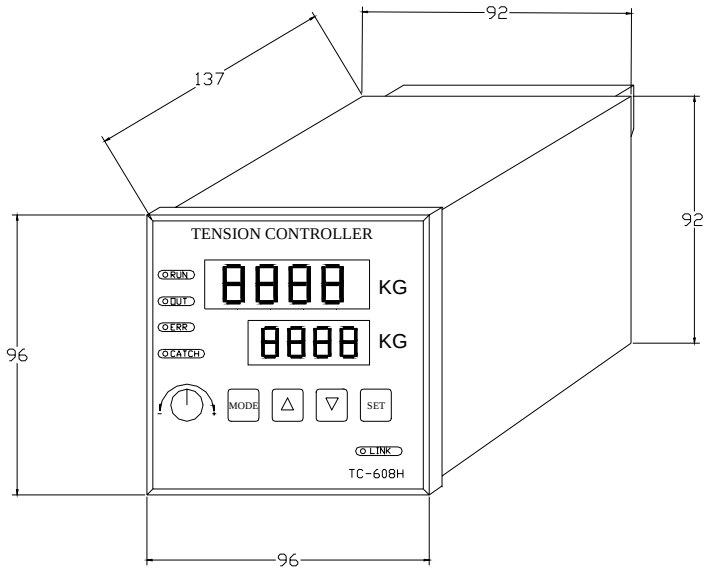


Roll-up



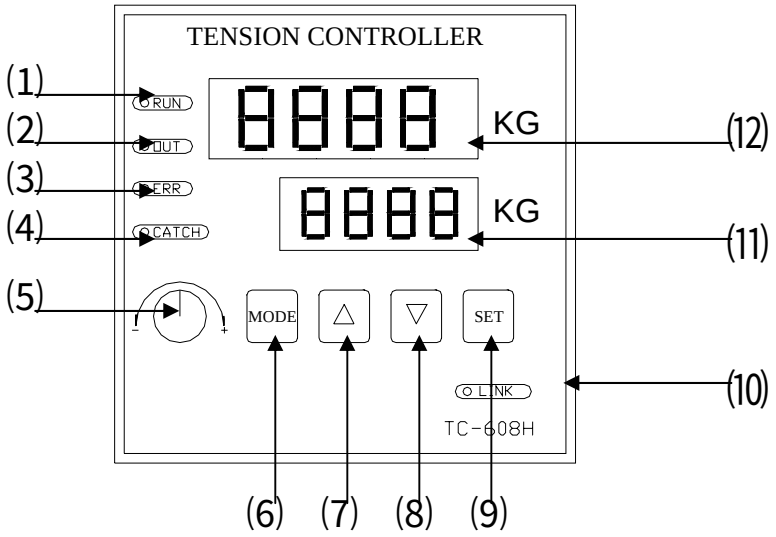
5. Product Check

Exterior and Dimensions



Unit: mm

Control Panel and Operating Directions



(1) Operating Status
(2) Relay Output
(3) Upper/Lower Limit Status
(4) Feedback Indicator
(5) VR Manual Output VR
(6) Change Parameter
(7) Increase
(8) Decrease
(9) Set Parameter
(10) Communication Status
(11) Tension Setting & Parameter Serial Number & Output Voltage
(12) Tension Displayed (Tension Value)

LED signals

Upper-row LED display: displays feedback value of Load Cell (actual tension value obtained on production line)
displays parameter values at time of setting

Lower-row LED display: displays preset tension value required by production line
parameter serial number at time of setting
displays current voltage output value

RUN: when this light flashes, 608H has initiated but has not started calculating
when it's lit, 608H has started calculating

OUT: the light is lit when RELAY1 and RELAY2 are in action

ERR: the light is lit when feedback value (output voltage by Load Cell) is => or =< preset upper/lower limits

CATCH: the light is lit when feedback value (output voltage by Load Cell) = preset value +- preset error

LINK: the light is lit when 608H successfully uses the communication function

Operating the Touch Keys

MODE: Parameter Change Key; short-circuit IP2 and IPCOM contacts and press MODE to change parameters

Increase; increasing preset value or parameter value

Decrease; decreasing preset value or parameter value

SET: parameter input key; press this key to enter after finishing changing parameter, or setting is incomplete

6. Operating TC-608H

Enter corresponding values used by the system's Load Cell into internal parameters of 608H (see "Parameters" for details.)

Press △ or ▽ on the control panel and enter the tension value needed. Or, set to "Manual" and use the control panel knob to enter the tension needed.

(See "Terminals" and "Parameters" for applicable contacts' functions and parameters.)

7. Electric Dimensions and Use Environment for Installation

- Power in: AC 220V ±10%, 50/60Hz
- Power consumption: <15W
- Analog tension input: A/D 14 bit
- Master speed input: A/D 8Bit
- Control output: D/A 12Bit
- Warning output (RELAY): RELAY, 250VAC, 1A
- Work temperature: 0º - 60ºC
- Storage temperature: -20º - 70ºC
- Temperature upper/lower limits: 0 - 95%RH
- Protect against rainwater, humidity, oil, salty, dust and metal.
- Protect against electro-magnetic interference. Keep away from radioactive materials and flammables.
- Weighing less than 1kg

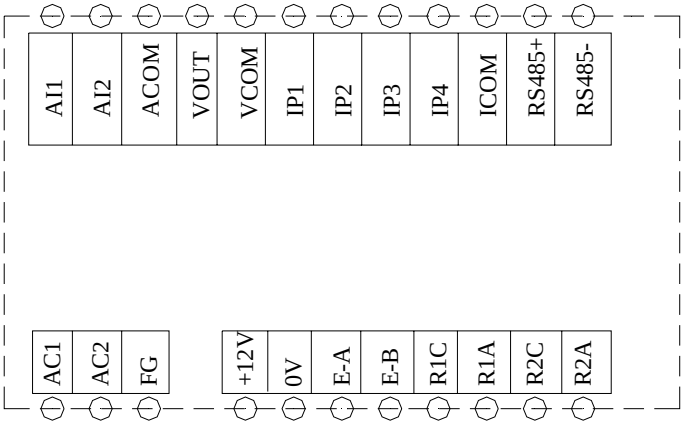
8. Wiring

Terminals' Functions

Serial #	Name	Function
1	AC1	Power AC220V
2	AC2	Power AC220V
3	FG	Power grounding
4	+12V	Digital control power DC12V
5	0V	Digital control power DC0V
6	E-A	-% Contact
7	E-B	PI calculation suspension
8	R1C	Relay 1 com
9	R1A	Relay 1 A contact
10	R2C	Relay 2 com
11	R2A	Relay 2 A contact
12	AI1	Tension feedback input 0-10VDC
13	AI2	Master speed input 0-10VDC
14	ACOM	Analog input common contact
15	+12V	Analog control power DC12V
16	VOUT	Analog output (+)
17	VCOM	Analog output (-)
18	IP1	Initiating contact (short circuit initiated, open circuit restored)
19	IP2	Contact allowing parameter change
20	IP3	Contact for stopping +-% actions
21	IP4	+% contact

Serial #	Name	Function
22	ICOM	Control contact common contact
23	485+	RS485+
24	485-	RS485-

Terminal Connections Diagram



Note 1: Signal transmission insulation cord is not to be placed together with power cord or in the same cord trough. Metal insulation cord is to be used.

Note 2: Terminals 9 and 10 are independent power outputs. They are insulated from other input zero potential.

9. Parameters

Parameter 1: Setting Password

Definition: Parameter change is allowed when password is set at 1000.

Scope: 0000 - 9999

Parameter 2: Feedback Upper Limit

Definition: Setting upper limit of tension feedback

Scope: 0000 - 9999

Parameter 3: Feedback Lower Limit

Definition: Setting lower limit of tension feedback

Scope: 0000 - 9999

Parameter 4: Insensitive Response Area

Definition: 608H takes no corrective action when the feedback value falls within the insensitive area (preset value +- preset value of this parameter.)

Scope: 0 - 255

Parameter 5: Voltage Output Scope

Definition: Restricting scope of voltage output (VOUT) See Note 1.

Scope: 0.01 - 10.00 (VDC)

Note 1: Total voltage output of 608H is restricted by the total of Pr16 and 21.

Parameter 6: Initiating Output Voltage

Definition: The output voltage when 608H initiates (i.e. IPCOM and IP1 short-circuit.) See Note 2.

Scope: 0 - 10.00 (VDC)

Note 2: Voltage output in advance has to wait until IP6 OPEN before calculating. This function may be used when objects are fastened before production line starts for the first time.

Parameter 7: Start-up Delay Time

Definition: Output voltage at start-up increases from 0V to the voltage set by Parameter 6 as the setting time of the parameter varies.

Scope: 0.1-25.5 (S)

Parameter 8: Terminating Voltage Output Percentage

Definition: When 608H stops working (i.e. when IPCOM and IP3 short-circuit) output voltage declines with the declining time set by Parameter 32. When the action is complete, 608H continues to work until calculation stops and contacts are connected (put-in plus, roll-up minus.) See Note 3.

Scope: 0 - 50.0 (%)

Parameter 9: Contact Percentage

Definition: When +-% contacts are connected, the preset value will make predetermined addition/deduction according to the present value (based on the preset value.)

Scope: 0 - 25.5 (%)

Parameter 10: Change Percentage When Master Speed Increases

Definition: When the production speed increases, use this parameter to help change the tension at time of accelerating.

Scope: 0 - 50.0 (%)

Parameter 11: Change Percentage When Master Speed Decreases

Definition: When the production speed decreases, use this parameter to help change the tension at time of decelerating.

Scope: 0 - 50.0 (%)

Parameter 12: Change Time When Master Speed Increases

Definition: The action time of Parameter 10.

Scope: 0.1-25.5 (S)

Parameter 13: Change Time When Master Speed Decreases

Definition: The action time of Parameter11.

Scope: 0.1-25.5 (S)

Parameter 14: 10 V Corresponding Numbers of Kilograms

Definition: The corresponding value when the feedback voltage of Load Cell is 10VDC. This may be set according to the actual need.

Scope: 1 - 9999

Parameter 15: Percentage Change Value

Definition: 608H percentage change value (instant change quantity.)

Scope: 0 - 99.99

Parameter 16: Voltage Scope for Percentage Change

Definition: The change scope for Parameter 15. If instant change quantity exceeds this parameter's setting, Parameter 16's setting will be used instead.

Scope: 0 - 10.00 (V)

Parameter 17: Integration Action Time

Definition: Setting the action time of 608H's integration calculation

Scope: 0.1 - 25.5 (seconds)

Parameter 18: Trace Integration Change Quantity

Definition: When the Load Cell feedback and preset tension are smaller than Parameter 20's setting, use this parameter's setting to change output, or fine-tune the setting.

Scope: 0.01 - 1.00(V)

Parameter 19: Normal Integration Change Quantity

Definition: When the Load Cell feedback and preset tension are larger than Parameter 20's setting, use this parameter's setting to change output, meaning setting normal change.

Scope: 0.01 - 2.55(V)

Parameter 20: Using the Error Scope of Trace Integration

Definition: Setting the mechanism to use either trace or normal Integration

Scope: 1 - 1000

Parameter 21: Voltage Scope for Integration Change

Definition: Change scope of Parameters19 and 20. If integration change has reached the setting of this parameter, output value is not to be changed.

Scope: 0 - 10.00(V)

Parameter 22: Setting Put-In and Roll-Up

Definition: Setting the operating mode of 608H: 0 = Put-In, 1 = Roll-Up (Parameters affected by this parameter include Parameters 10, 11 and 32.)

Parameter 23: Tension Average Time

Definition: Setting the average displaying time of the upper row

Scope: 0.01 - 2.55 (SEC)

Parameter 24: Reserved (Judgment Voltage initiated)

Definition:

Scope: (0.01-2.55)

Parameter 25: Tension Decimal Point

Definition: Setting the decimal point of tension displayed (upper row)

Scope: (0 - 3)

Parameter 26: Setting Functions on the Control Panel

Definition: Setting Control Panel Knob Functions and Content Displayed in Lower

Row

Scope: 0 = No Control Panel Adjustment and Lower Row Display Settings; 1 = Adjustable on the Control Panel and Lower Row Display Settings
2=No Control Panel Adjustment and Lower Row Display Voltage; 3 =Able to be Adjusted on the Control Panel and Lower Row Display Voltage

Parameter 27: MODBUS Communication Address (1 - 32)

Parameter 28: Communication Speed 1:2400, 2:4800, 3:9600 and 4:19200

Parameter 29: RELAY 1 Designated Output Method

0 = Designating Communication
1 = Startup
2 = Feedback HI
3 = Feedback LOW
4 = Feedback Normal

Parameter 30: RELAY 2 Designated Output Method

0 = Designating Communication
1 = Startup
2 = Feedback HI
3 = Feedback LOW
4 = Feedback Normal

Parameter 31: Initiating Augmentative Output Time

Definition: Maintaining the Time Setting of Initiating Augmentative Output
Scope: 0.1- 25.5(S)

Parameter 32: Emergency Termination of Output Time

Definition: Maintaining emergency termination of output time
Scope: 0.1- 25.5(S)

Parameter33: Initiating Augmentative Output Percentage

Definition: Percentage Setting of Output Augmentation Needed at Startup
Scope: 0-25.5 (%)

Parameter34: Terminating Compensation Output Time

Definition: Maintenance of Terminating Output Time (x 0.1 Sec.)
Scope: 0.1-25.5 (Sec.)

Parameter35: Terminating Compensation Percentage

Definition: Maintenance of Terminating Output Voltage
Scope: 0-3000 (%)

Parameter36: Change Percentage of Differentiation

Definition: Differentiation Change Percentage adjustment
Scope: 0-99.99 (%)

Parameter37: Declining Percentage of Differentiation

Definition: Differentiation Declining Percentage adjustment
Scope: 1-99 (%)

10. Plus/Minus Percentage

11. Parameter List

Serial #	Parameter	Scope	User Settings	Note
1	Password	0000 - 9999		
2	Upper Limit	0000 - 9999		
3	Lower Limit	0000 - 9999		
4	Insensitive Area	0 - 255		
5	Voltage Output Scope	0.01 - 10.00		
6	Initiating Output Voltage	0.00 - 10.00		
7	Initiating Delayed Time	0.01- 25.5		
8	Terminating Voltage Output Percentage	0 - 50.0		
9	Contact Percentage	0 - 10.00		
10	Change Percentage When Master Speed Increases	0 - 50.0		
11	Change Percentage When Master Speed Decreases	0 - 50.0		
12	Change Time When Master Speed Increases	0.1- 25.5		
13	Change Time When Master Speed Decreases	0.1- 25.5		
14	10 V Corresponding Numbers of Kilograms	1 - 9999		
15	Percentage Change Value	0 - 99.99		
16	Voltage Scope for Percentage Change	0 - 10.00		
17	Integration Action Time	0.1 - 25.5		
18	Trace Integration Change Quantity	0.01 - 1.00		
19	Normal Integration Change Quantity	0.01 - 2.55		
20	Using the Error Scope of Trace Integration	1 - 1000		
21	Voltage Scope for Integration Change	0 - 10.00		
22	Setting Put-In and Roll-Up	0, 1		
23	Tension Average Time	0.01 - 2.55		
24	Reserved (Judgment Voltage initiated)	0.01 - 2.55		
25	Tension Decimal Point	0-3		
26	Setting Functions on the Control Panel of 608H	0-3		

Serial #	Parameter	Scope	User Settings	Note
27	MODBUS Communication Address	1-32		
28	Communication Speed	1-4		
29	RELAY 1 Designated Output Method	0-4		
30	RELAY 2 Designated Output Method	0-4		
31	Initiating Augmentative Output Time	0.1- 25.5		
32	Emergency Termination of Output Time	0.1- 25.5		
33	Initiating Augmentative Output Percentage	0 - 25.5		
34	Terminating Compensation Output Time	0.1-25.5 (S)		
35	Terminating Compensation Percentage	0-3000 (%)		
36	Change Percentage of Differentiation	0-99.99 (%)		
37	Declining Percentage of Differentiation	1-99 (%)		

12. Communication Parameter List

13. Appendix: Feedback Equipment

14. A: Load Cell