Specifications

Case
Input
Outputs:
- Electromechanical relay
- SSR
- MOS gate
- Output for external SSR
- OUT1
- OUT2
- Power Supply
- Excitation Voltage
- Relay switching differential over set-point for output
- Relay switching differential under set-point for output
- ON duration of output
- OFF duration of output
- Calibration
- Filter Time
- Filter Band
- Hold On
- Hold Off
- Direction 1
- Direction 2
- Return
- Lock Keyboard

Warranty and Support

Warranty
HYDROTECHNIK warrants this product to be free from defects in materials and workmanship for 2 years. If your unit is found to be defective within that time, we will promptly repair or replace it. This warranty does not cover accidental damage, wear or tear, or consequential or incidental loss. This warranty does not cover any defects caused by wrong transportation, storage, installation, or operating (see 'Specifications').

Technical support
In the unlikely event that you encounter a problem with your HYDROTECHNIK device, please call your local dealer or contact directly our support team.

Configuration Parameters

Parameter | Symbol | Description
--- | --- | ---
Point Position | Pnt | The display decimal point position
Input Type | inP | The type of the signal that can be connected to the device input in case of programmable input
Input Low | IL0 | Display value at low limit of the input range
Input High | IH1 | Display value at high limit of the input range
Display Offset | oFFS | Specifies a constant to be added to the measured input value
Filter Time | t | Specifies the relative time constant of the input filter
Filter Band | b | Specifies a zone around the measured value, within which the filter is active
Calibration | cal | Enables/disables calibration mode
Return | rtn | Forced return to Basic level

Parameters of the control algorithm

Parameter | Symbol | Description
--- | --- | ---
+ Differential 1 | dF1 | Relay switching differential over set-point for output OUT1
- Differential 1 | mF1 | Relay switching differential under set-point for output OUT1
Hold On 1 | Ho1 | Holds the output activation of output OUT1
Hold Off 1 | HoF1 | Holds the output deactivation of output OUT1
Direction 1 | dir1 | Control action direction of output OUT1
Time On 1 | yon1 | ON duration of output OUT1
Time Off 1 | yof1 | OFF duration of output OUT1
+ Differential 2 | dF2 | Relay switching differential over set-point for output OUT2
- Differential 2 | mF2 | Relay switching differential under set-point for output OUT2
Direction 2 | dir2 | Control action direction of output OUT2
Return | rtn | Forced return to Basic level

Parameters of Basic (operating) level

Parameter | Symbol | Description
--- | --- | ---
Set Point 1 | SP1 | Set-point value of output OUT1
Set Point 2 | SP2 | Set-point value of output OUT2

Keyboard locking Parameter

Parameter | Symbol | Description
--- | --- | ---
Lock Keyboard | Loc* | Keyboard locking mode
Return | rtn | Forced return to Basic level

* Changing Point Position value reflects the real value of all parameters with ISU of 100 to 10.000!!

With potentiometric input, after wiring the device and setting desired values to Input Low and Input High value, it is necessary to adjust the device to display 0% regularly. 

Ti08 Operation Manual

Please read this Operation Manual before mounting and operating! 
Save the Manual for future references!
TIO8 is an economical 4-digit programmable process indicator / trip alarm unit with an input for linear current, voltage, and resistive signals. The device can be ordered with up to 2 relay outputs and for mains or low-voltage AC/DC supply.

### Electro-Magnetic Interference (EMI) Issues
- **Important note:**
  - A built-in RC noise suppression circuit is connected in parallel with relay contacts. Full AC voltage isolation is NOT provided when relay contacts are open. Small AC current (= 1.5 mA at 230 VAC) still flows through the RC circuit!
- All signal wires must be shielded: They must not be packaged together with power cables!
- Never lay the signal wires close to inductive or capacitive noise sources, such as relays, contactors, motors, etc.!
- All shields have to be grounded ONLY at one end, as closer as possible to the indicator terminals!
- Avoid sharing supply lines with powerful consumers, especially with inductive loads, switched on and off.
- To stop unwelcome interference signals entering through the power supply lines, use shielded 1:1 isolation transformer!
- Shunt all switched (not only those switched by the indicator) inductive consumers with special suppression networks: RC group and varistor - for AC loads, or diode - for DC loads.
- If the indicator operates in a very powerful EMI area, it has to be mounted inside a grounded metal shielding box!

### Important notes:
- **Under range** messages are not displayed in case of 0 voltage input!
Program Levels

**Parametric level**
This level contains the control algorithm parameters. If no alarm output is installed, this level does not show up.

♦ Enter from Basic level by pressing and holding until PAr appears on the display. Release the key. If the key is not released on time, TI10 enters Configuration level.

♦ Choose a parameter using and .

♦ To enter parameter value adjustment mode, press .

♦ If no key has been pressed for a while, the device automatically returns to Basic level, storing all confirmed changes.

♦ To exit, select parameter rtn and press .

♦ For quick exiting and saving, use key combination + .

**Configuration level**
This level contains the configuration parameters of the device.

♦ Enter from Basic level by pressing and holding until con appears.

♦ To access and adjust the configuration parameters, follow the algorithm described in "Parametric level".

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### Table 1

<table>
<thead>
<tr>
<th>Value</th>
<th>Unit</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 0, 0.00, 0.000</td>
<td>-</td>
<td>when indicating values with the input-signal measurement unit (ISU)</td>
</tr>
<tr>
<td>u10, u5, i0, i4</td>
<td>-</td>
<td>u10 (0...10 V), u5 (0...5 V; potentiometer 0.5...10 kΩ), i0 (0...20 mA), i4 (4...20 mA)</td>
</tr>
<tr>
<td>-1999...0999 ISU</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-1999...0999 ISU</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-1999...0999 ISU OFFSET</td>
<td>0...255</td>
<td>higher value for better filtration</td>
</tr>
<tr>
<td>0...3000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>no, YES</td>
<td>-</td>
<td>For authorized personnel ONLY!</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0...0999 ISU</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0...0999 sec</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0...9999 sec</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>++L__V++</td>
<td>-</td>
<td>++L_ (relay ON under set point), _V++ (relay ON over set point)</td>
</tr>
<tr>
<td>0...255 sec</td>
<td>-</td>
<td>Value '0' enables Pulse mode.</td>
</tr>
<tr>
<td>0...255 sec</td>
<td>-</td>
<td>Value '0' enables Pulse mode.</td>
</tr>
<tr>
<td>0...0999 ISU</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>-</td>
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<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

-1999...0999 ISU within operating range limits Input Low ... Input High

-1999...0999 ISU within operating range limits Input Low ... Input High

d*EY, ESP, E=EY | - | d*EY (keyboard disabled), ESP (only set-point adjustment enabled), E=EY (keyboard enabled) |
| - | - | - |

E.g.: changing Point Position value from (x1) to (x0.1) would change a Set-point value and Input High, check the PV(100%) value when potentiometer slide is positioned at 100%, set new Input High value as calculated by the formula:
**Parameter Programming**

**Indicator parameters**

TI08 is a programmable device whose service behavior is determined by a set of parameters. All the parameters, along with their names, symbols, and value ranges, are given in Table 1.

**Setting numerical parameter value**

- Enter parameter value adjustment mode (see ’Program Levels’).
- The whole part of the value together with the left zeroes appears on the display, and the rightmost digit blinks.
- To increase or decrease the blinking digit value, use respectively and.
- The 3 rightmost digits can accept values from 0 to 9, and the leftmost digit can also accept the values - and .
- To select another digit, press.
- Confirm the adjusted value by pressing simultaneously.
- If the new value has not been confirmed and no key has been pressed for a certain period of time, value adjustment automatically ceases, and the parameter retains its initial value.

**Setting symbolic parameter value**

- Enter parameter value adjustment mode (see ’Program Levels’).
- Read the blinking parameter value.
- To change the value, use and, and to confirm, press.
- If the new value has not been confirmed and no key has been pressed for a certain period of time, value adjustment automatically ceases, and the parameter retains its initial value.

**Program Levels**

- **Programming order**
  - Unlock the keyboard;
  - Set the parameters from Configuration level;
  - Set the parameters from Parametric level;
  - Adjust alarm set points;
  - Lock the keyboard (if needed).

- **Hidden level**
  - Hold depressed while turning the power on and until Loc appears.
  - Set keyboard locking mode.
  - To exit, use or to select parameter rtn, then press.

- **Basic level**
  - At power-on, TI08 enters Basic level. At this level, the device indicates the measured input value (PV) with a resolution, according to the Point Position parameter.
  - To enter parameter value adjustment mode for Set Point 1, press.
  - To enter parameter value adjustment mode for Set Point 2, press (for cases 'L' and 'M').