
# ICON PROCESS CONTROL TVF Series TVF Flow Display and Batcher User Manual



ICON™
PROCESS CONTROLS

**LevelPro®— TVF Series**
**Flow Display | Controller | Batcher**
**Corrosion-Free**
**Instrumentation Equipment**
**Quick Start Manual**


Read the user's manual carefully before starting to use the unit.
Producer reserves the right to implement changes without prior notice.

Contents



## Symbol Explanation ⚠

This symbol denotes especially important guidelines concerning the installation and operation of the device. Not complying with the guidelines denoted by this symbol may cause an accident, damage or equipment destruction.

## Basic Requirements | User Safety

- Do not use the unit in areas threatened with excessive shocks, vibrations, dust, humidity, corrosive gasses and oils.
- Do not use the unit in areas where there is risk of explosions.
- Do not use the unit in areas with significant temperature variations, exposure to condensation or ice.
- The manufacturer is not responsible for any damages caused by inappropriate installation, not maintaining the proper environmental conditions and using the unit contrary to its assignment.
- If in the case of a unit malfunction there is a risk of a serious threat to the safety of people or property additional, independent systems and solutions to prevent such a threat must be used.
- The unit uses dangerous voltage that can cause a lethal accident. The unit must be switched off and disconnected from the power supply prior to starting installation of troubleshooting (in the case of malfunction).
- Do not attempt to disassemble, repair or modify the unit yourself. The unit has no user serviceable parts.
- Defective units must be disconnected and submitted for repairs at an authorized service center.

## Specifications

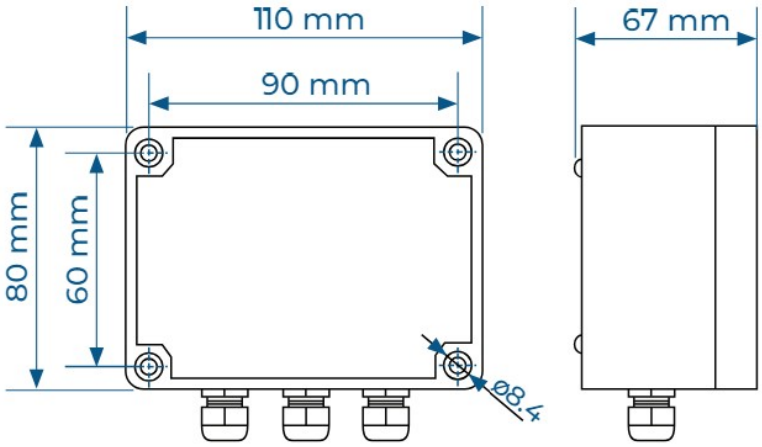
| | |
|---|---|
| **General** | |
| Display | LED \| 6 Digit \| 13mm High \| Red \| Adjustable Brightness |
| Displayed Values | 0 ~ 999999 |
| RS485 Transmission | 1200…115200 bit/s, 8N1 / 8N2 |
| Housing Material | ABS \| Polycarbonate |
| Protection Class | NEMA 4X \| IP67 |
| **Input Signal \| Supply** | |
| Standard | Current: 4-20mA \| 0-20mA \| 0-5V* \| 0-10V* |
| Voltage | 85 – 260V AC/DC \| 16 – 35V AC, 19 – 50V DC* |
| **Output Signal \| Supply** | |
| Standard | 2 x Relays (5A) \| 1 x Relay (5A) + 4-20mA |
| Communication | RS485 |
| Voltage | 24VDC |
| Passive current output * | 4-20mA \| (Operating Range Max. 2.8 – 24mA) |
| **Performance** | |
| Accuracy | 0.1% @ 25°C One Digit |
| **Temperatures** | |
| Operating Temperature | -40 – 158°F \| -40 – 70°C |

## Front Panel Description

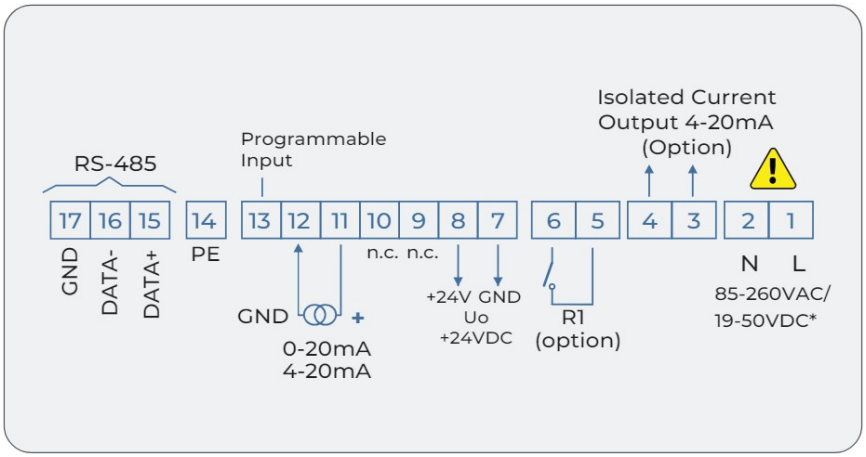

## Function of Push Buttons

| | |
|---|---|
|  | **Symbol used in the manual: [ESC/MENU]**<br>**Functions:**<br>• Enter to main menu ( press and hold for at least 3 sec.)<br>• Exit the current Screen and Enter to previous menu (or measure mode)<br>• Cancel the changes made in parameter being edited |
|  | **Symbol used in the manual : [ENTER/PAUSE]**<br>**Functions:**<br>• Start to edit the parameter<br>• Enter into the sub-menu<br>• Confirmation of changes made in parameter being edited<br>• While batcher mode : Pause / Start Batching |
|  | **Symbol used in the manual : [ ∑ /RESET]**<br>**Functions:**<br>• Switching of the display between total and instantaneous measurements or batcher c ounter (while batcher mode only)<br>• Zeroing the currently displayed counter (Press & Hold for at least 2 Sec), the zeroing must be confirmed by [ENTER] button |
|  | **Symbol used in the manual : [ ∧ ] [ ∨ ]**<br>**Functions:**<br>• Change of the present menu<br>• Modification of the parameter value<br>• Switching of the display between relay thresholds and number of batches counter. |

## Dimensions

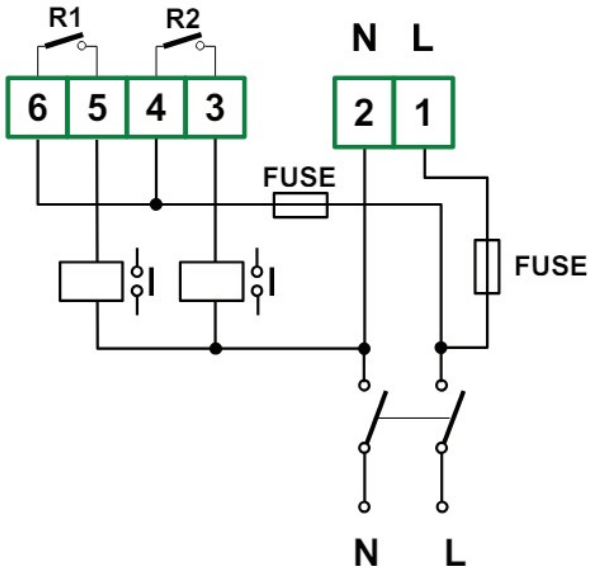



## Wiring Diagram




⚠ Due to possible significant interference in industrial installations, appropriate measures assuring correct operation of the unit must be applied.
The unit is not equipped with an internal fuse or power supply circuit breaker.
For this reason, an external time-delay cut-out fuse with a small nominal current value must be used (recommended bipolar, max. 2A) and a power supply circuit breaker located near the unit.

## Power Supply & Relay Connection




**Depending on Version**
85/230/260V AC/DC ; 50 – 60 Hz
19/24 – 50V DC ; 16/24/35V AC

⚠ Contacts of relay outputs are not equipped with spark suppressors. When using the relay outputs for switching of inductive loads (coils, contactors, power relays, electromagnets, motors etc.) it is required to use additional suppression circuit (typically capacitor 47nF/ min. 250VAC in series with 100R/5W resistor), connected in parallel to relay terminals or (better) directly on the load.

### Suppression Circuit Connection

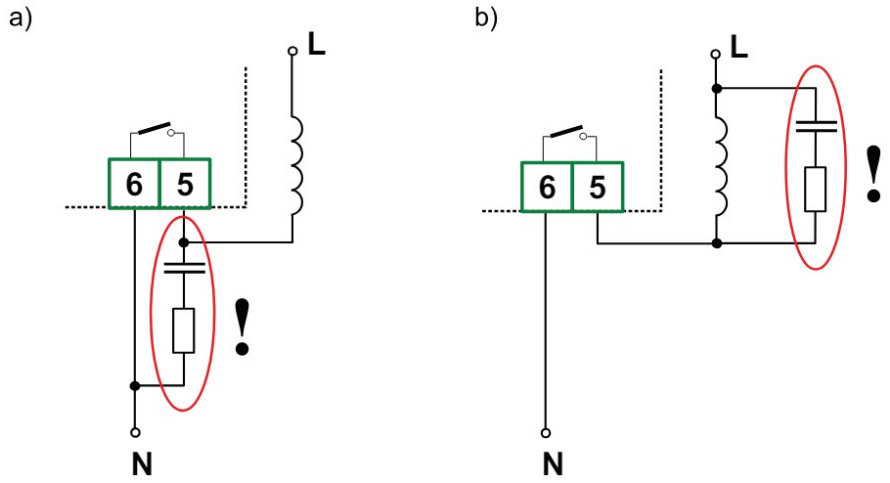



**Figure: Examples of Suppression Circuit Connection**
a) To Stepper Relay Terminals b) To the Inductive Load (Motor)

### OC-Type Output Connection

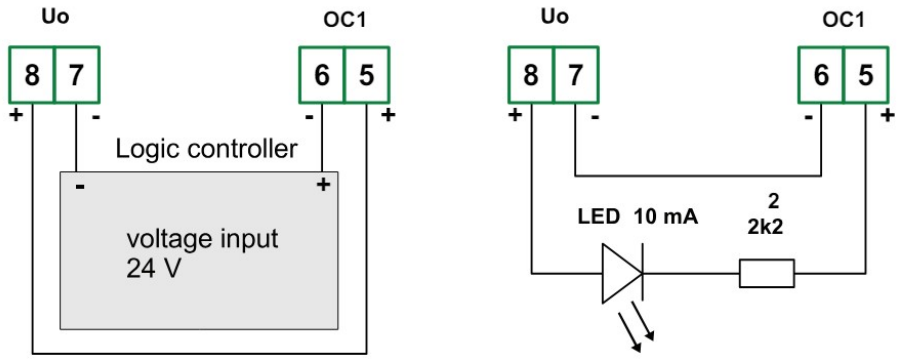



Figure: Examples of OC-type output connection

### Current Output Connection Using Internal Power Supply

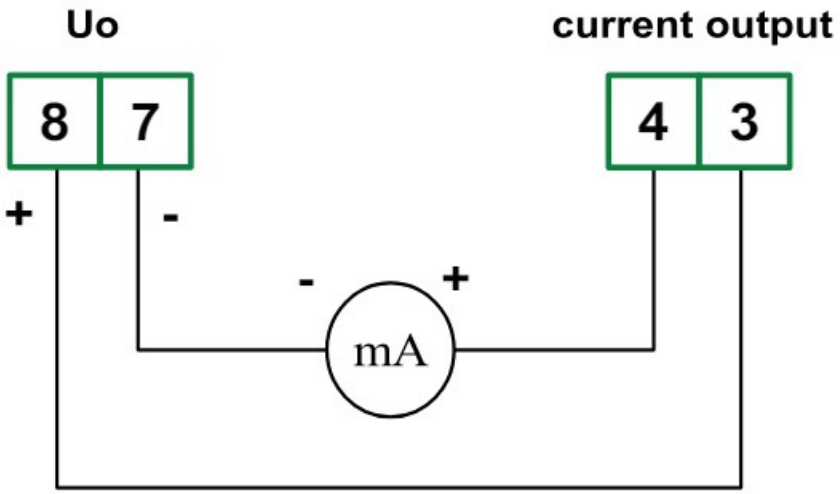



Figure: Example of current output connection using internal power supply

### Current Output Connection Using External Power Supply

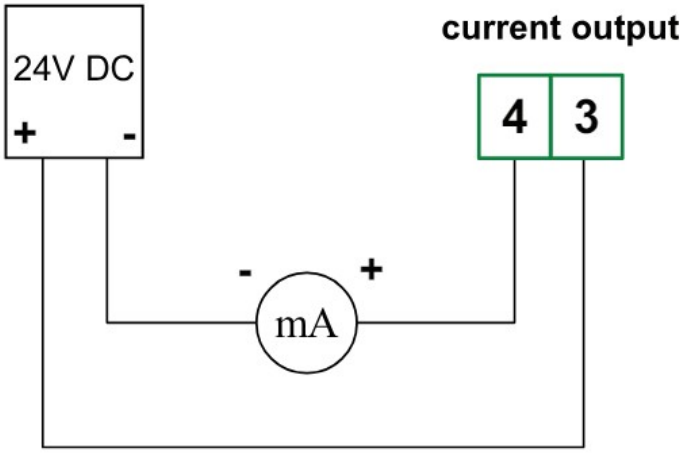
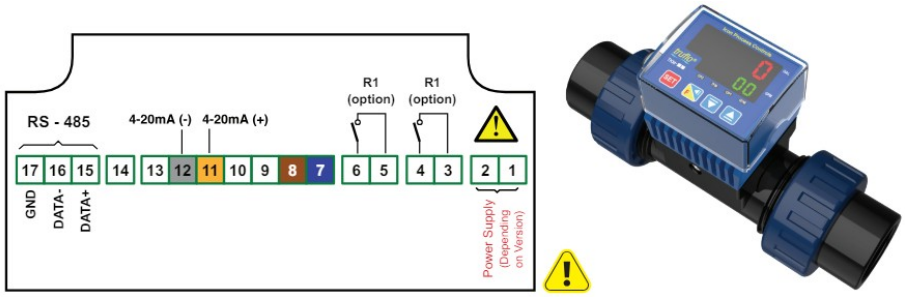


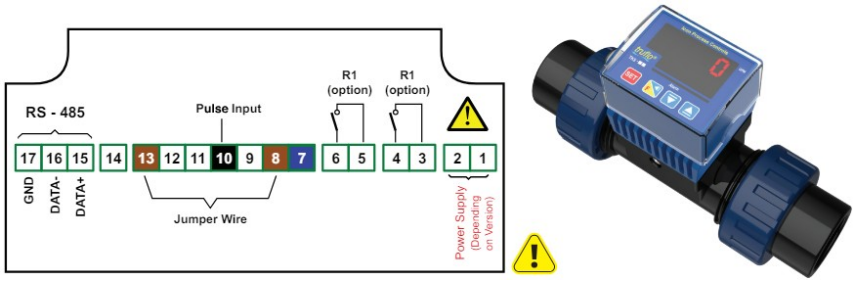
Figure: Example of current output connection using external power supply

### Flow Meter Connections (Relay Type)

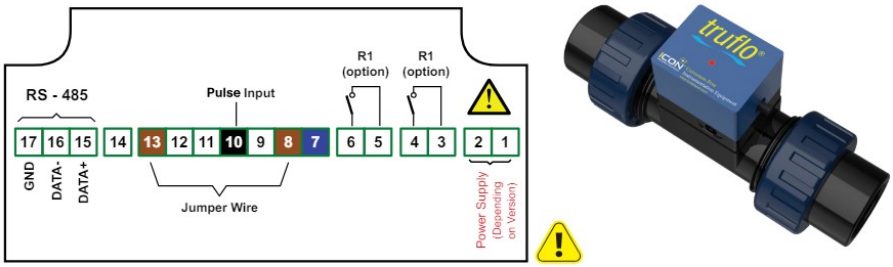
| **TKM Series : 4-20mA Output** | | |
|---|---|---|
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 11 | Yellow | mA+ |
| 12 | Grey | mA- |



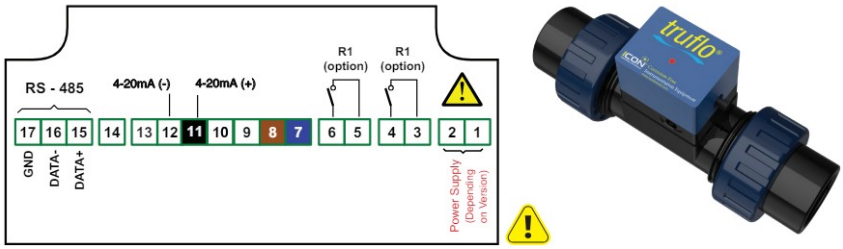

| **TKS Series : Pulse Output** | | |
|---|---|---|
| GPM/Pulse = K factor | | |
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 10 | Black | NPN Pulse |
| Jump 13 G 8 | | |



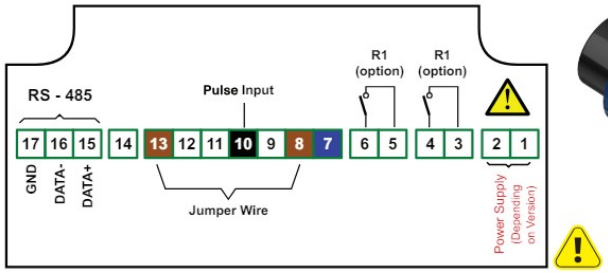

| **TKW Series : Pulse Output** | | |
|---|---|---|
| GPM/Pulse = K factor | | |
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 10 | Black | Pulse |
| Jump 13 G 8 | | |



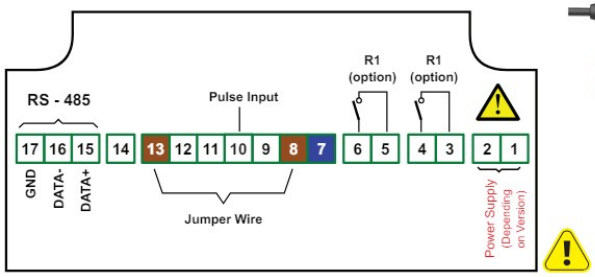

| **TKW Series : 4-20mA Output** | | |
|---|---|---|
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 11 | Black | mA+ |
| 12 | White | mA- |



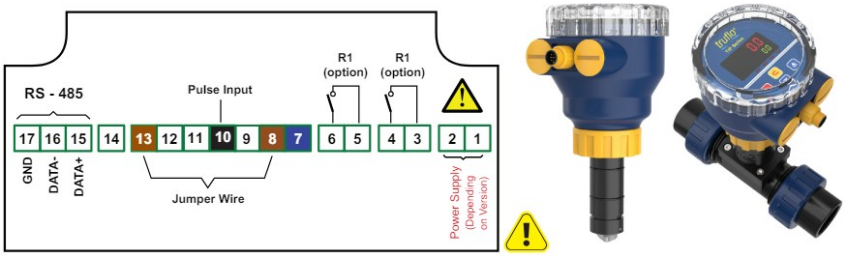
| **TKP Series : Pulse Output** | | |
|---|---|---|
| GPM/Pulse = K factor | | |
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 10 | Black | Pulse |
| Jump 13 G 8 | | |



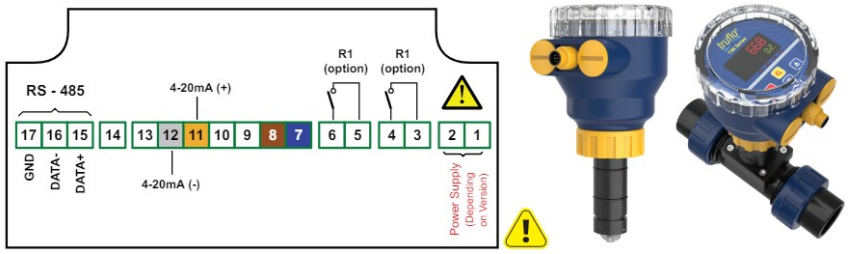

| **TIW Series : Pulse Output** | | |
|---|---|---|
| GPM/Pulse = K factor | | |
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 10 | White | Pulse |
| Jump 13 G 8 | | |



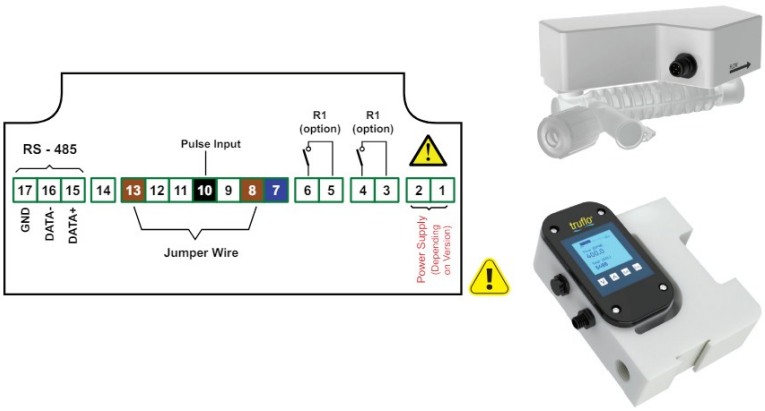

| **TIM \| TIP Series : Pulse Output** | | |
|---|---|---|
| GPM/Pulse = K factor | | |
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 10 | Black | Pulse |
| Jump 13 G 8 | | |



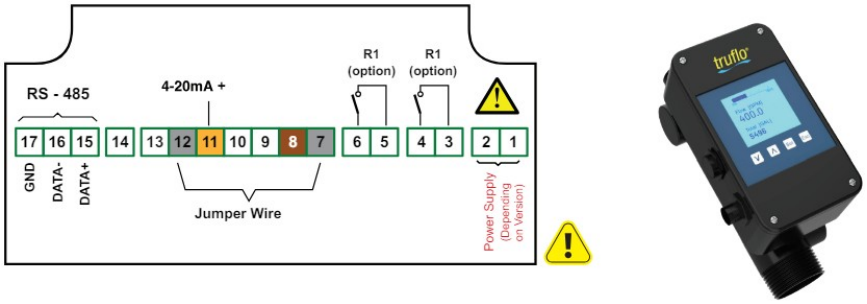

| **TIM Series : 4-20mA Output** | | |
|---|---|---|
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 11 | Yellow | mA+ |
| 12 | Grey | mA- |



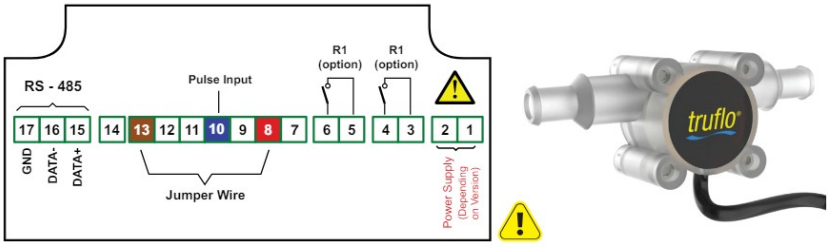

| **UF 1000 \| 4000 \| 5000 – Pulse Output** | | |
|---|---|---|
| GPM/Pulse = K factor | | |
| TVF Terminal | Pin | Description |
| 8 | 1 | +VDC |
| 10 | 2 | Pulse |
| 7 | 3 | -VDC |
| Jump 13 G 8 | | |



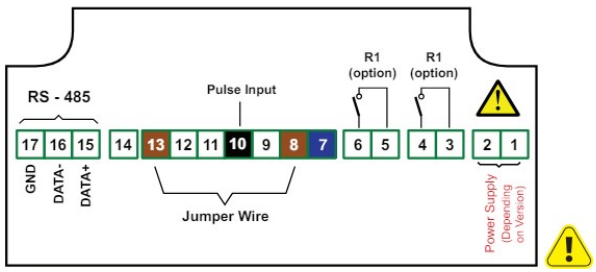

| **UF 1000 \| 4000 \| 5000 – 4-20mA Output** | | |
|---|---|---|
| TVF Terminal | Pin | Description |
| 8 | 1 | +VDC |
| 11 | 2 | +mA |
| 7 | 3 | -VDC |
| Jump 12 G 7 | | |




| **ProPulse (Flying Lead) – Pulse Output** | | |
|---|---|---|
| GPM/Pulse = K factor | | |
| TVF Terminal | Wire Color | Description |
| 7 | Shield | -VDC |
| 8 | Red | +VDC |
| 10 | Blue | Pulse |
| Jump 13 G 8 | | |



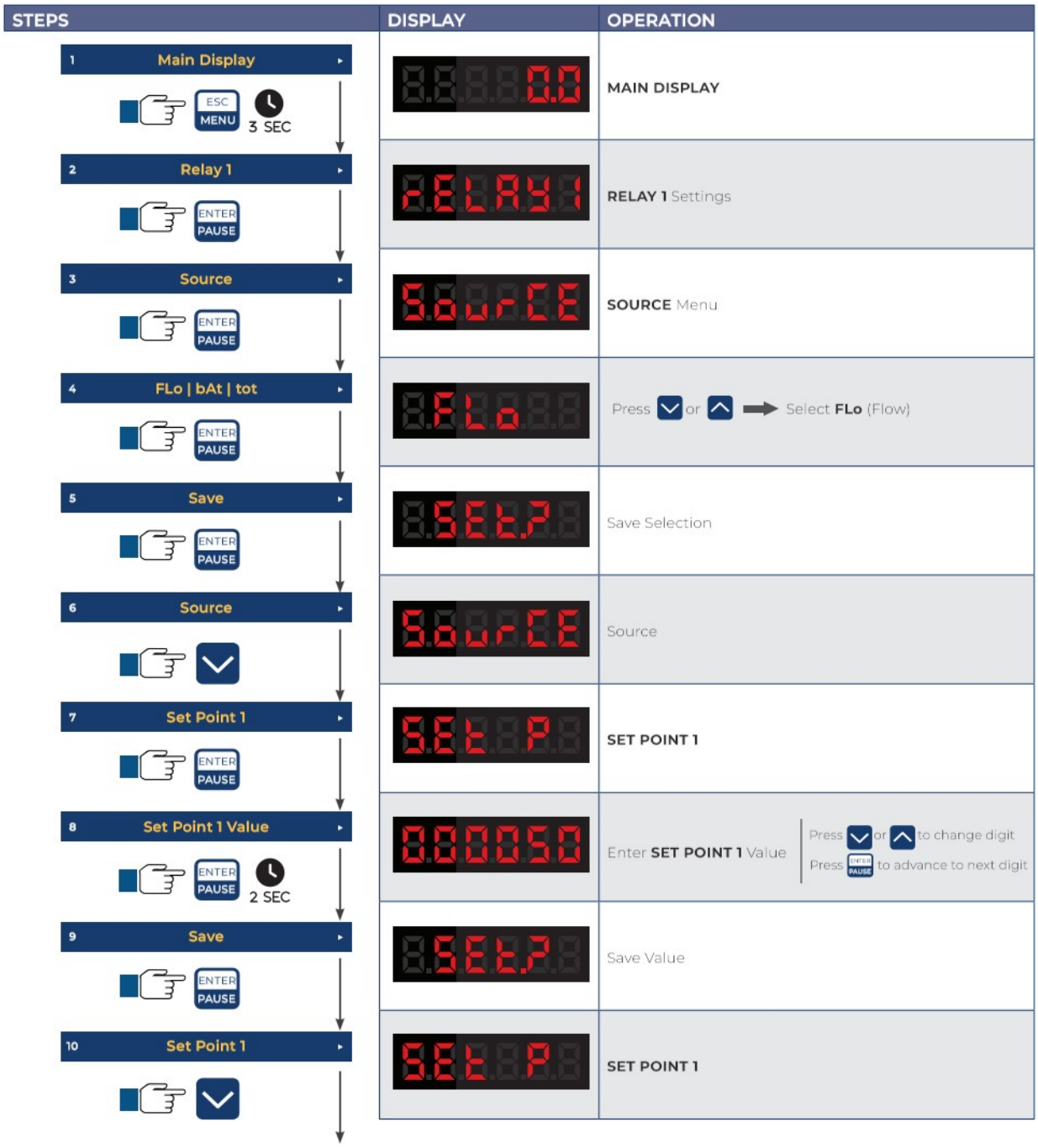
| ProPulse®2 – Pulse Output | | |
|---|---|---|
| TVF Terminal | Wire Color | Description |
| 7 | Blue | -VDC |
| 8 | Brown | +VDC |
| 10 | Black | Pulse |
| Jump 13 G 8 | | |




## Programming K Factor

| STEPS | DISPLAY | OPERATION |
|---|---|---|
| 1 Main Display — ESC MENU 3 SEC | 0.0 | MAIN DISPLAY |
| 2 Relay 1 — X 2 | rELAY1 | **RELAY 1** Settings |
| 3 Input — ENTER PAUSE | inPUt | **INPUT** Menu |
| 4 K Factor — ENTER PAUSE | PULSEL | Press or → Select **PULSEL** (K Factor) |
| 5 K Factor Value — ENTER PAUSE 2 SEC | 00630 | Enter **K FACTOR** Value. Press or to change digit. Press ENTER PAUSE to advance to next digit. Note: Enter the K Factor value according to the Flow Unit. Eg: To display flow in GPM, Enter K Factor corresponding to GPM. |
| 6 Save Value — ENTER PAUSE | SEtP | Save Selection |
| 7 K Factor — ESC MENU | PULSEL | PULSEL |
| 8 Input — ESC MENU | inPUt | Input Menu |
| 9 Main Display | 0.0 | Main Display |

## Programming Relays

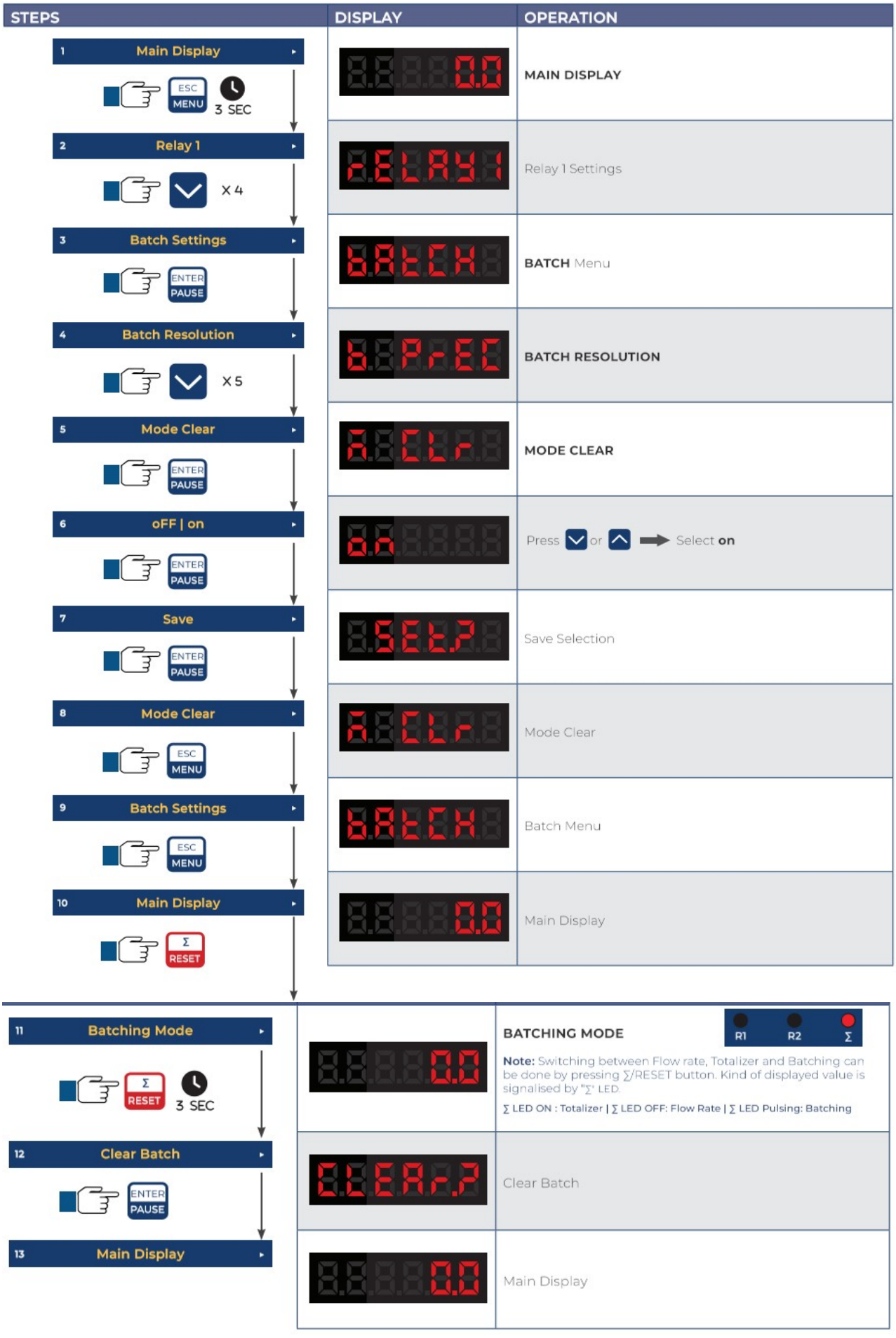



## Programming Batching


**Programming Output (For 4-20mA Output Models)**

| STEPS | DISPLAY | OPERATION |
|---|---|---|
| 1 Main Display ▸   |   | **MAIN DISPLAY** |
| 2 Relay 1 ▸   |   | Relay 1 Settings |
| 3 Output ▸   |   | **OUTPUT** Menu |
| 4 Output Mode ▸   |   | **OUTPUT MODE** |
| 5 4-20mA ▸   |   | Press or → Select **4-20** |
| 6 Save ▸   |   | Save Selection |
| 7 Output Mode ▸  |   | Select **OUTPUT MODE** |
| 8 Source ▸   |   | **SOURCE** Menu |
| 9 FLo \| bAt \| tot ▸   |   | Press or → Select **FLo** (Flow) |
| 10 Save ▸   |   | Save Selection |


## Resetting Batch




## Resetting Totalizer


## Setting Decimal Point


* To change decimal points for Batch | Totalizer, select Batch | Totalizer Menu

## Warranty, Returns and Limitations

### Warranty

Icon Process Controls Ltd warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service in accordance with instructions furnished by Icon Process Controls Ltd for a period of one year from the date of sale of such products. Icon Process Controls Ltd obligation under this warranty is solely and exclusively limited to the repair or replacement, at Icon Process Controls Ltd option, of the products or components, which Icon rocess Controls Ltd examination determines to its satisfaction to be defective in material or workmanship within the warranty period. Icon Process Controls Ltd must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired under this warranty will be warranted only for the remainder of the original warranty period. Any product provided as a replacement under this warranty will be warranted for the one year from the date of replacement.

### Returns

Products cannot be returned to Icon Process Controls Ltd without prior authorization. To return a product that is thought to be defective, go to www.iconprocon.com, and submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to Icon Process Controls Ltd must be

shipped prepaid and insured. Icon Process Controls Ltd will not be responsible for any products lost or damaged in shipment.

**Limitations**

This warranty does not apply to products which: 1) are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above; 2) have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use; 3) have been modified or altered; 4) anyone other than service personnel authorized by Icon Process Controls Ltd have attempted to repair; 5) have been involved in accidents or natural disasters; or 6) are damaged during return shipment to Icon Process Controls Ltd reserves the right to unilaterally waive this warranty and dispose of any product returned to Icon Process Controls Ltd where: 1) there is evidence of a potentially hazardous material present with the product; or 2) the product has remained unclaimed at Icon Process Controls Ltd for more than 30 days after Icon Process Controls Ltd has dutifully requested disposition. This warranty contains the sole express warranty made by Icon Process Controls Ltd in connection with its products. ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED. The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. IN NO EVENT SHALL Icon Process Controls Ltd BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF Icon Process Controls Ltd. This warranty will be interpreted pursuant to
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For additional product documentation and technical support visit:
www.iconprocon.com | e-mail: sales@iconprocon.com or support@iconprocon.com | Ph: 905.469.9283

**Corrosion-Free**
**Instrumentation Equipment**
**24-0293**


## Documents / Resources

| | |
|---|---|
|  | ICON PROCESS CONTROL TVF Series TVF Flow Display and Batcher [pdf] User Manual<br>TVF Series TVF Flow Display and Batcher, TVF Series, TVF Flow Display and Batcher, Flow Display and Batcher, Display and Batcher, Batcher |

## References

- User Manual