Valuetesters TVF Series Flow Display User Guide

Contents

Valuetesters TVF Series Flow Display

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	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

Product Usage Instructions

User Safety Guidelines

- Do not use the unit in areas threatened with excessive shocks, vibrations, dust, humidity, corrosive gases, and oils.
- Avoid using the unit in areas prone to explosions or significant temperature variations.
- Ensure proper environmental conditions are maintained to prevent damage.
- In case of malfunction, disconnect the unit and seek professional repair services.
- Use caution as the unit operates with dangerous voltage; always switch off before troubleshooting.

Installation and Operation

1. Follow the wiring diagram for correct installation.
2. Avoid disassembling, repairing, or modifying the unit yourself.
3. Use additional safety systems if a malfunction poses a serious threat.
4. Submit defective units for repair at authorized service centers.

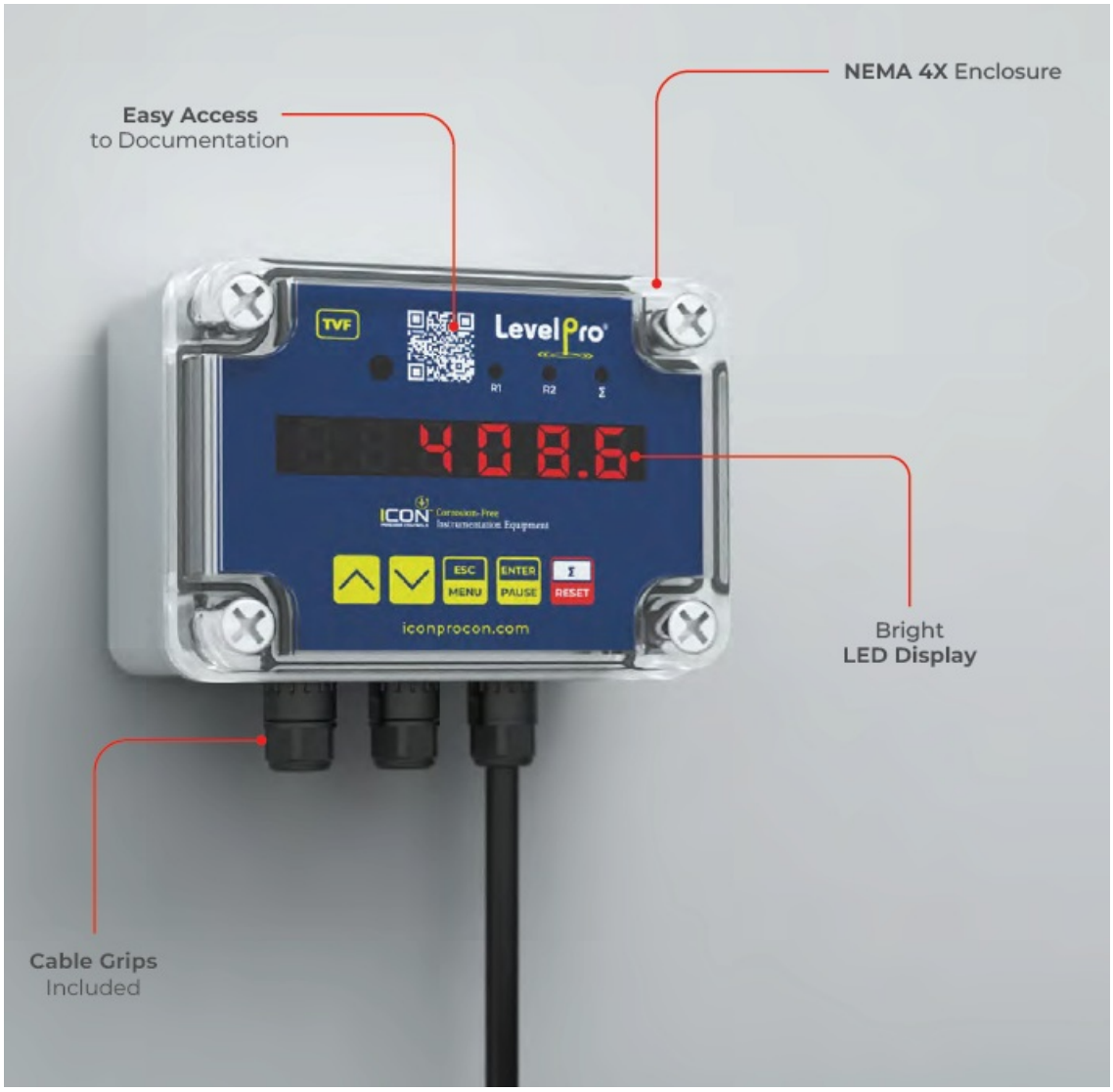
Front Panel Description

- Relay LED indicators for easy monitoring.
- Super ‘SunBright’ LED display with adjustable brightness levels.
- Flow and Batching mode LED indicators for operational status.
- Push-button programming with functions like ENTER, PAUSE, and RESET.

Dimensions

- 110 mm x 90 mm x 67 mm
- 80 mm x 60 mm x Ø8.4

FEATURES



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.

Front Panel Description

Function of Push Buttons

- ESC MENU **Symbol used in the manual : [ESC/MENU]**

  Functions:
  - Enter to main menu (press and hold for at least 3 sec.)
  - Exit the current Screen and Enter to previous menu (or measure mode)
  - Cancel the changes made in parameter being edited
- ENTER PAUSE **Symbol used in the manual : [ENTER/PAUSE]**

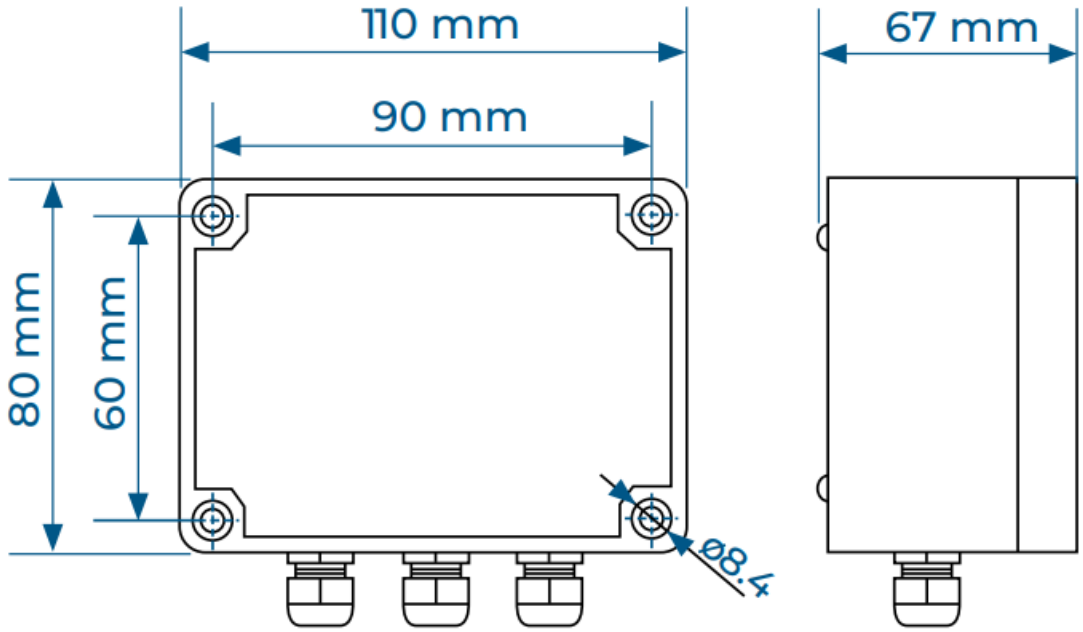
  Functions:
  - Start to edit the parameter
  - Enter into the sub-menu
  - Confirmation of changes made in parameter being edited
  - While batcher mode : Pause / Start Batching

- **Symbol used in the manual : [Σ /RESET]**

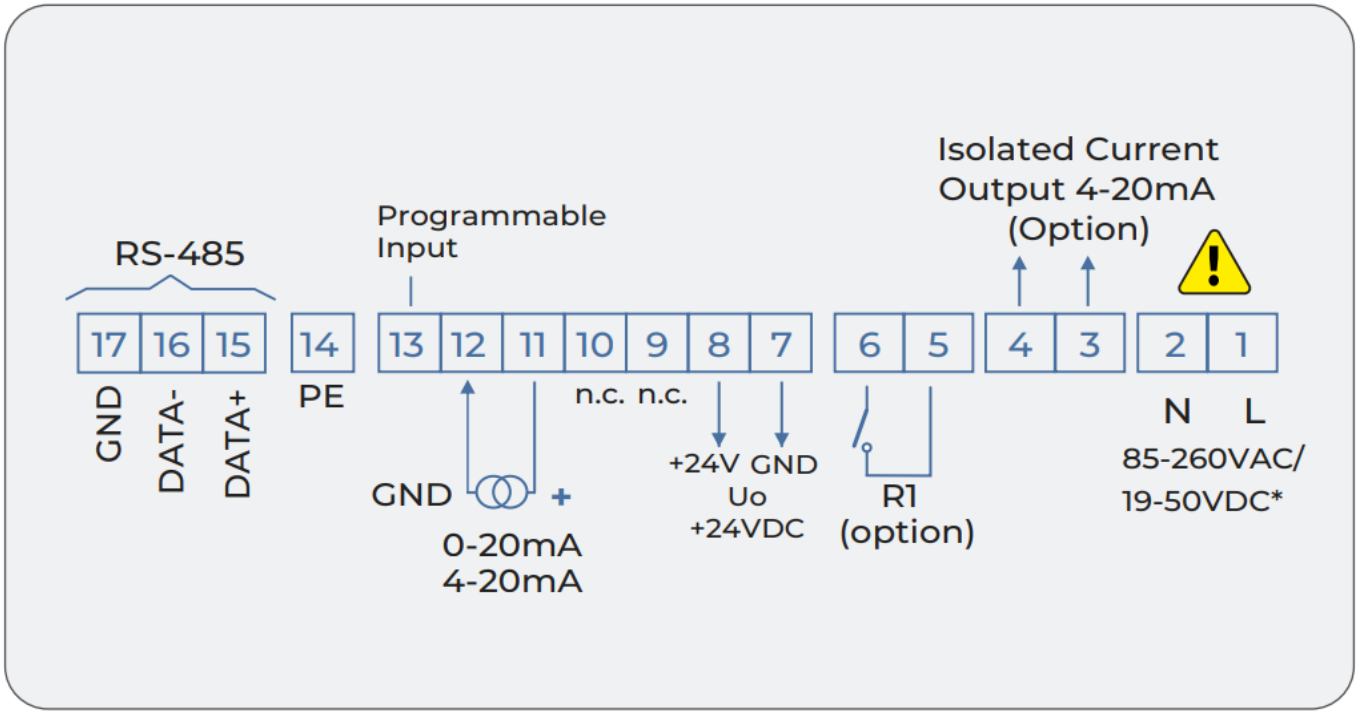
  Functions:
  - Switching of the display between total and instantaneous measurements or batcher counter (while batcher mode only)
  - Zeroing the currently displayed counter (Press & Hold for at least 2 Sec), the zeroing must be confirmed by [ENTER] button
- **Symbol used in the manual :**

  Functions:
  - Change of the present menu
  - Modification of the parameter value
  - Switching of the display between relay thresholds and number of batches counter

Dimensions

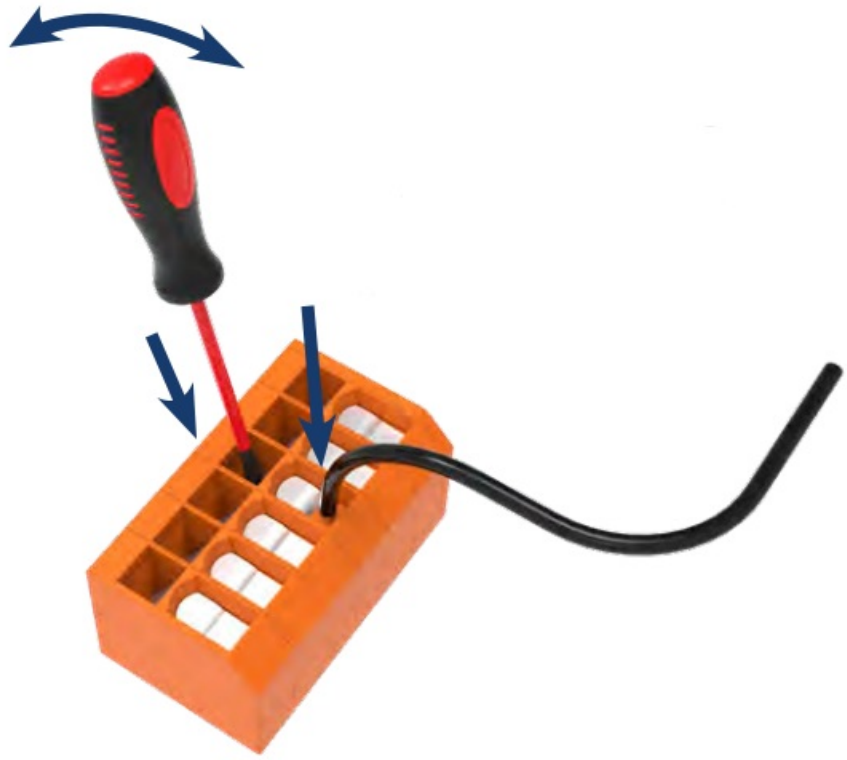


Wiring Diagram



WIRE INSTALLATION

- Insert screwdriver and push wire locking mechanism open
- Insert wire
- Remove screwdriver

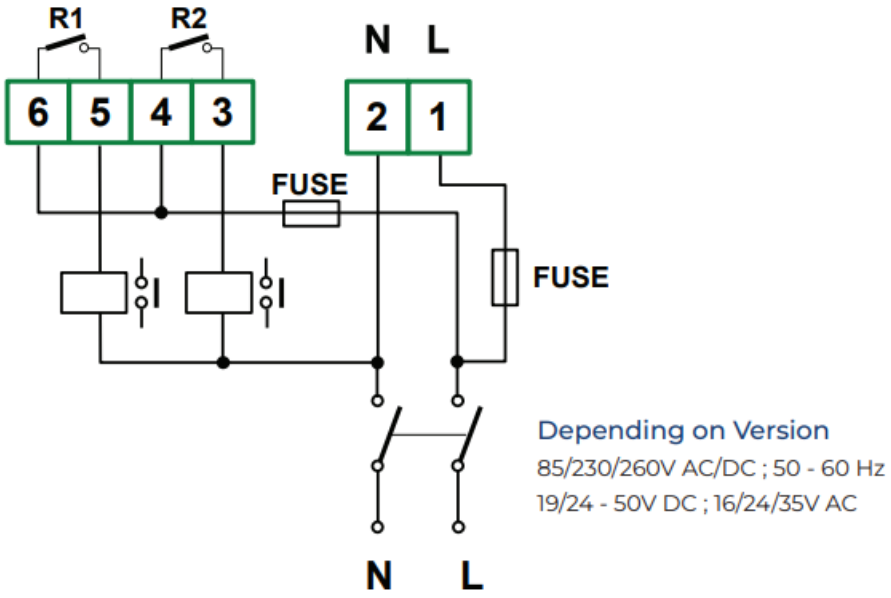


- Due to possible significant interference in industrial installations, appropriate measures assuring correct operation of the unit must be applied.
- The unit is not equipped with an internal fuse or power supply circuit breaker.
- For this reason, an external time-delay cut-out fuse with a small nominal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

(recommended bipolar, max. 2A) and a power supply circuit breaker located near the unit.

Connections

Power Supply & Relay Connection



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

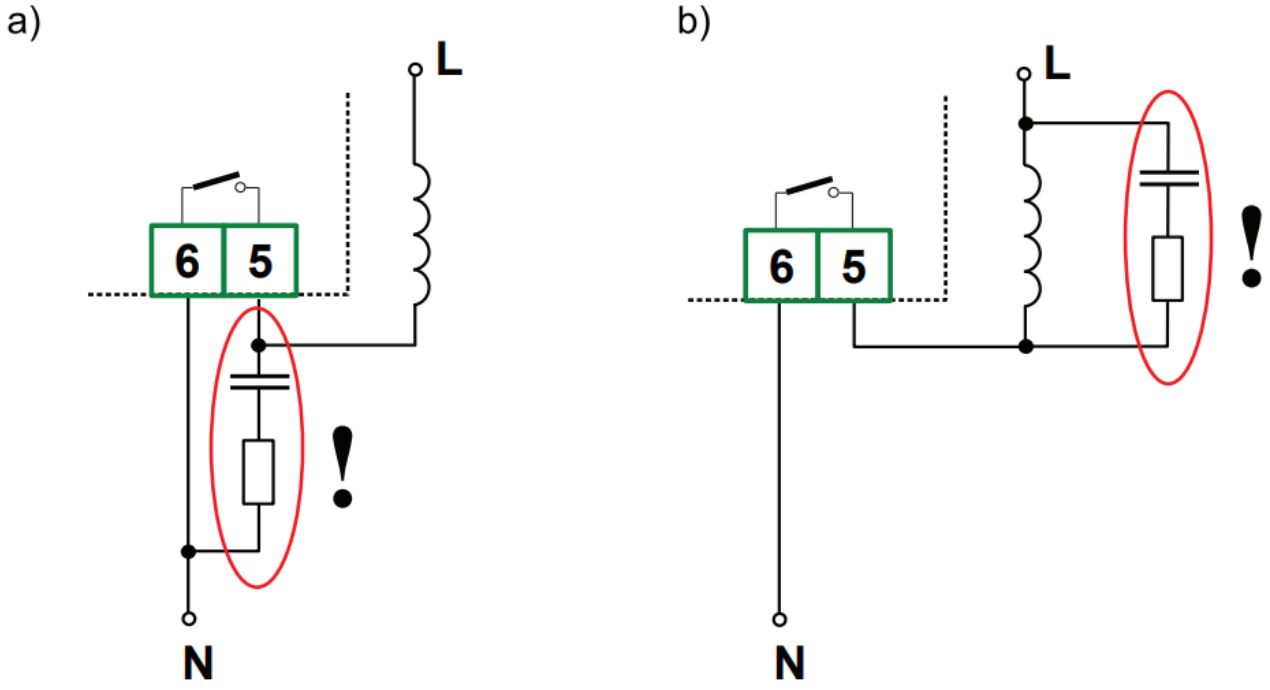


Figure: Examples of Suppression Circuit Connection
a) To Stepper Relay Terminals b) To the Inductive Load (Motor)

OC-Type Output Connection

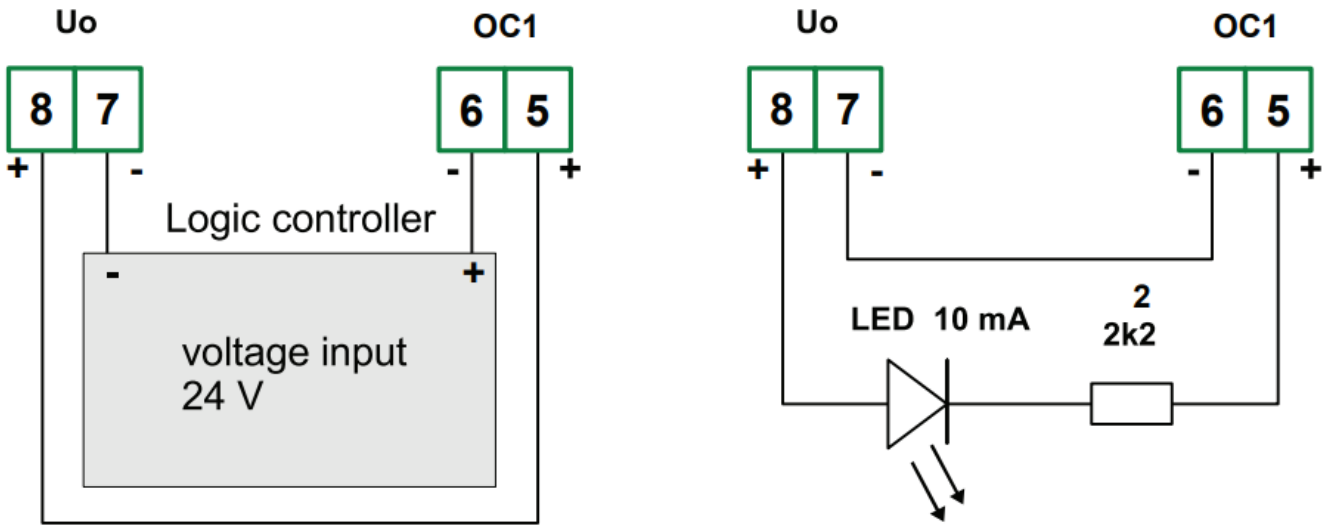


Figure: Examples of OC-type output connection

Current Output Connection Using Internal Power Supply

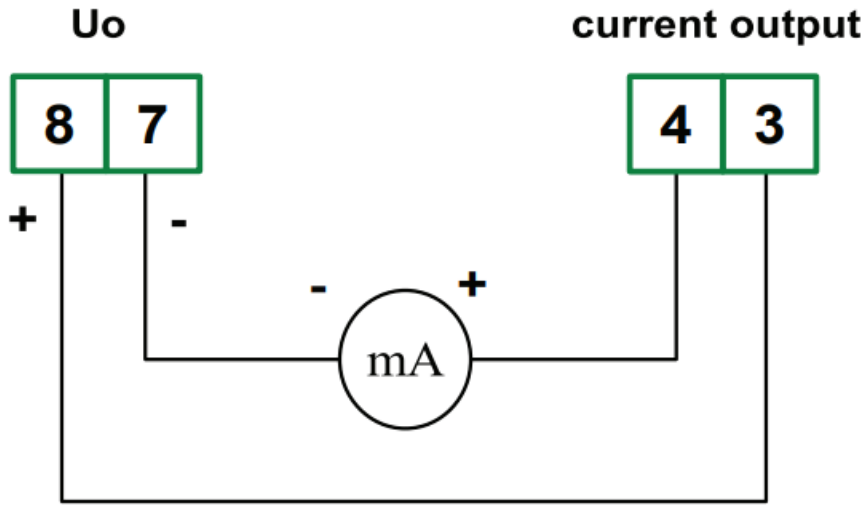


Figure: Example of current output connection using internal power supply

Current Output Connection Using External Power Supply

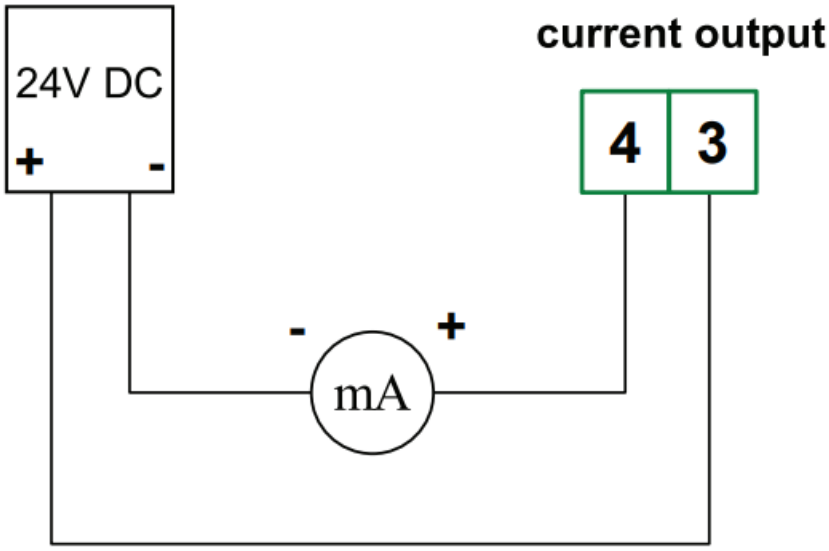
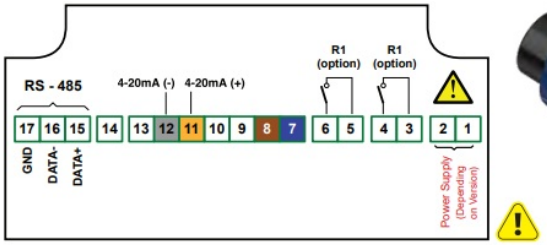


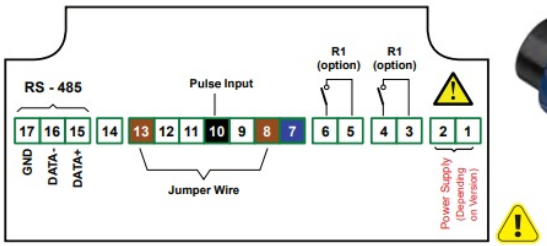
Figure: Example of current output connection using external power supply

Flow Meter Connections (Relay Type)

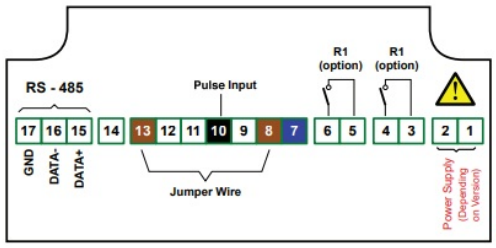
TKM Series : 4-20mA Output		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
11	Yellow	mA+
12	Grey	mA-



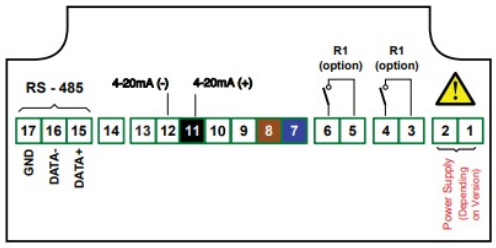
TKS Series : Pulse Output		
GPM/Pulse = K factor		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
10	Black	NPN Pulse
Jump 13 & 8		



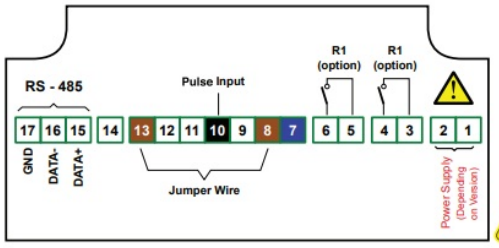
TKW Series : Pulse Output		
GPM/Pulse = K factor		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
10	Black	Pulse
Jump 13 & 8		



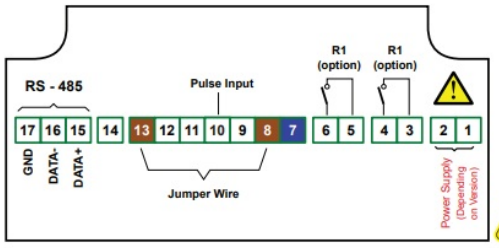
TKW Series : 4-20mA Output		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
11	Black	mA+
12	White	mA-



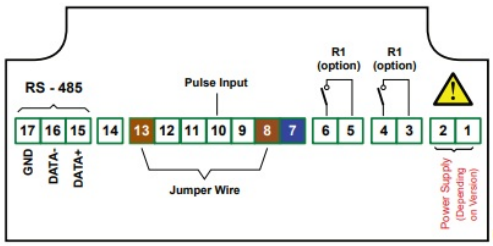
TKM | TKP Series : Pulse Output		
GPM/Pulse = K factor		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
10	Black	Pulse
Jump 13 & 8		



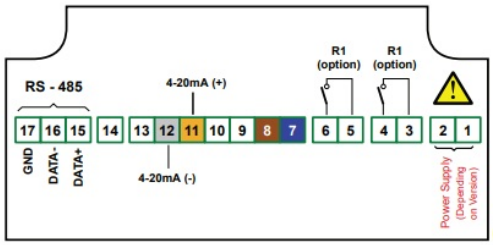
TIW Series : Pulse Output		
GPM/Pulse = K factor		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
10	White	Pulse
Jump 13 & 8		



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

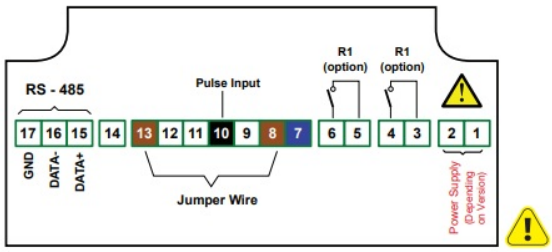


TIM Series : 4-20mA Output		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
11	Yellow	mA+
12	Grey	mA-

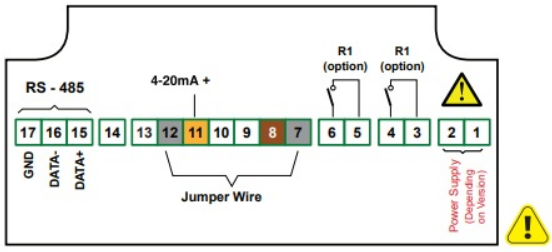


Flow Display | Controller | Batcher

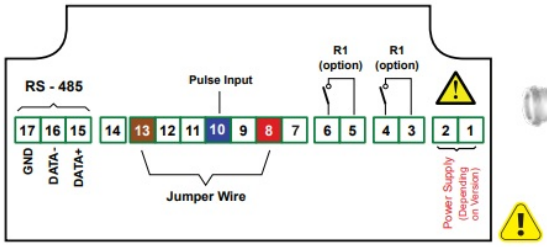
UF 1000 | 4000 | 5000 – Pulse Output		
GPM/Pulse = K factor		
TVF Terminal	Pin	Description
8	1	+VDC
10	2	Pulse
7	3	-VDC
Jump 13 & 8		



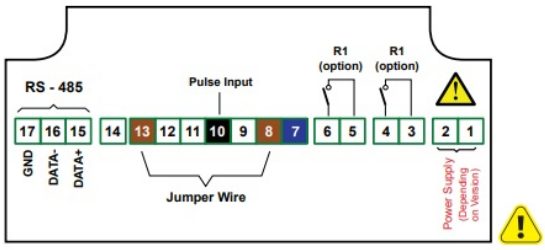
UF 1000 | 4000 | 5000 – 4-20mA Output		
TVF Terminal	Pin	Description
8	1	+VDC
11	2	+mA
7	3	-VDC
Jump 12 & 7		



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 & 8		



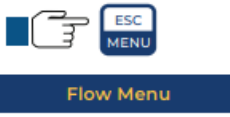
ProPulse®2 – Pulse Output		
TVF Terminal	Wire Color	Description
7	Blue	-VDC
8	Brown	+VDC
10	Black	Pulse
Jump 13 & 8		



Programming K Factor (For Pulse Input Models)

STEPS	DISPLAY	OPERATION
1 Main Display ▸ 		**MAIN DISPLAY**
2 Relay 1 ▸ 		**RELAY 1** Settings
3 Input ▸ 		**INPUT** Menu
4 K Factor ▸ 		Press or → Select **PULSEL** (K Factor)
5 K Factor Value ▸ 		Enter **K FACTOR** Value Press or to change digit Press 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 ▸ 		Save Selection
7 K Factor ▸ 		PULSEL
8 Input ▸ 		Input Menu
9 Main Display ▸		Main Display

STEPS	DISPLAY	OPERATION
1 Main Display ▸ 		**MAIN DISPLAY**
2 Relay 1 ▸ 		**RELAY 1** Settings
3 Flow Menu ▸ 		**FLOW** Menu
4 Input Type ▸ 		**INPUT TYPE** Factory Default: 4-20mA
5 Low Calibration (4mA) ▸ 		**LOW CALIBRATION** Setting Lo CAL = 4mA Value
6 4mA Value ▸ 		Enter **4mA** Value Factory Default: 000.0 Press ▼ or ▲ to change digit Press ENTER PAUSE to advance to next digit
7 Save Selection ▸ 		Save Selection
8 Low Calibration (4mA) ▸ 		Low Calibration Setting
9 High Calibration (20mA) ▸ 		**HIGH CALIBRATION** Setting Hi CAL = 20mA Value

STEPS	DISPLAY	OPERATION
10 20mA Value ▸ 		Enter **20mA** Value Factory Default: 100.0 Press ▼ or ▲ to change digit Press ENTER PAUSE to advance to next digit
11 Save Selection ▸ 		Save Selection
12 High Calibration (20mA) ▸ 		High Calibration Setting
13 Flow Menu ▸ 		Flow Menu
14 Main Display ▸		Main Display

STEPS	DISPLAY	OPERATION
1 Main Display ▸ 		**MAIN DISPLAY**
2 Relay 1 ▸ 		**RELAY 1** Settings
3 Source ▸ 		**SOURCE** Menu
4 FLo | bAt | tot ▸ 		Press or → Select **FLo** (Flow)
5 Save ▸ 		Save Selection
6 Source ▸ 		Source
7 Set Point 1 ▸ 		**SET POINT 1**
8 Set Point 1 Value ▸ 		Enter **SET POINT 1** Value Press or to change digit Press to advance to next digit
9 Save ▸ 		Save Value
10 Set Point 1 ▸ 		**SET POINT 1**

STEPS	DISPLAY	OPERATION
1 Main Display ESC/MENU 3 SEC	0.0	**MAIN DISPLAY**
2 Relay 1 ENTER/PAUSE	rELAY1	**RELAY 1** Settings
3 Source ENTER/PAUSE	SourCE	**SOURCE** Menu
4 FLo | bAt | tot ENTER/PAUSE	bAt	Press ⌄ or ⌃ ➡ Select **bAt** (Batch)
5 Save ENTER/PAUSE	SEt.P	Save Selection
6 Source ⌄	SourCE	Source Menu
7 Set Point ENTER/PAUSE	SEt P	**SET POINT**
8 Set Point Value ENTER/PAUSE 2 SEC	000050	Enter **SET POINT** Value — Press ⌄ or ⌃ to change digit; Press ENTER/PAUSE to advance to next digit
9 Save ENTER/PAUSE	SEt.P	Save Value
10 Set Point ESC/MENU	SEt P	Set Point
11 Relay 1 ESC/MENU	rELAY1	Relay 1 Menu
12 Main Display ∑/RESET	0.0	Main Display
13 Batching Mode ENTER/PAUSE to start batching	50	**BATCHING MODE** (R1 R2 ∑) **Note:** Switching between Flow rate, Totalizer and Batching can be done by pressing ∑/RESET button. Kind of displayed value is signalised by "∑" LED. ∑ LED ON : Totalizer | ∑ LED OFF: Flow Rate | ∑ LED Pulsing: Batching

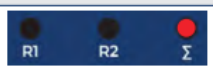
STEPS	DISPLAY	OPERATION
1 Main Display ▸ 		**MAIN DISPLAY**
2 Relay 1 ▸ 		Relay 1 Settings
3 Output ▸ 		**OUTPUT** Menu
4 Output Mode ▸ 		**OUTPUT MODE**
5 4-20mA ▸ 		Press or Select **4-20**
6 Save ▸ 		Save Selection
7 Output Mode ▸ 		Select **OUTPUT MODE**
8 Source ▸ 		**SOURCE** Menu
9 FLo | bAt |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

STEPS	DISPLAY	OPERATION
11 Source ▸ 		Source Menu
12 4mA ▸ 		Setting **4mA (LOW VALUE)**
13 4mA Value ▸ 		Enter **4mA** Value Press ⌄ or ⌃ to change digit Press ENTER/PAUSE to advance to next digit
14 Save ▸ 		Save Value
15 4mA ▸ 		4mA (Low Value)
16 20mA ▸ 		Setting **20mA (HIGH VALUE)**
17 20mA Value ▸ 		Enter **20mA** Value Press ⌄ or ⌃ to change digit Press ENTER/PAUSE to advance to next digit
18 Save ▸ 		Save Value
19 20mA ▸ 		20mA (High value)
20 Output ▸ 		Output Menu
21 Main Display ▸		Main Display

STEPS	DISPLAY	OPERATION
1 Main Display ESC MENU 3 SEC		**MAIN DISPLAY**
2 Relay 1 X 4		Relay 1 Settings
3 Batch Settings ENTER PAUSE		**BATCH** Menu
4 Batch Resolution X 5		**BATCH RESOLUTION**
5 Mode Clear ENTER PAUSE		**MODE CLEAR**
6 oFF | on ENTER PAUSE		Press or Select **on**
7 Save ENTER PAUSE		Save Selection
8 Mode Clear ESC MENU		Mode Clear
9 Batch Settings ESC MENU		Batch Menu
10 Main Display Σ RESET		Main Display

STEPS	DISPLAY	OPERATION
11 Batching Mode Σ RESET 3 SEC		**BATCHING MODE** R1 R2 Σ **Note:** Switching between Flow rate, Totalizer and Batching can be done by pressing ∑/RESET button. Kind of displayed value is signalised by "∑" LED. ∑ LED ON : Totalizer | ∑ LED OFF: Flow Rate | ∑ LED Pulsing: Batching
12 Clear Batch ENTER PAUSE		Clear Batch
13 Main Display		Main Display

STEPS	DISPLAY	OPERATION
1 Main Display ▸ 		**MAIN DISPLAY**
2 Relay 1 ▸ 		Relay 1 Settings
3 Totalizer Menu ▸ 		**TOTALIZER** Menu
4 Totalizer Resolution ▸ 		**BATCH RESOLUTION**
5 Mode Clear ▸ 		**MODE CLEAR**
6 oFF | on ▸ 		Press or ➡ Select **on**

STEPS	DISPLAY	OPERATION
7 Save ▸ 		Save Selection
8 Mode Clear ▸ 		Mode Clear
9 Totalizer Menu ▸ 		Totalizer Menu
10 Main Display ▸ 		Main Display
11 Totalizer Mode ▸ 		**TOTALIZER MODE**  **Note:** Switching between Flow rate, Totalizer and Batching can be done by pressing ∑/RESET button. Kind of displayed value is signalised by "∑" LED. ∑ LED ON : Totalizer | ∑ LED OFF: Flow Rate | ∑ LED Pulsing: Batching
12 Clear ▸ 		Clear Totalizer
13 Main Display ▸		Main Display

Warranty

Warranty, Returns and Limitations

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 Process 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 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 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 that:

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 the laws of the province of Ontario, Canada.
- If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.

- Valuetesters.com
- info@valuetesters.com

FAQ

Q: Can I use the unit in areas with explosive risks?
A: No. Avoid using the unit in areas at risk of explosions to prevent accidents.

Q: What should I do if the unit malfunctions?
A: Disconnect the unit immediately and seek professional repair services at authorized centers.

Q: How do I adjust the brightness of the LED display?
A: Use the provided push buttons to adjust the brightness level of the LED display.

Documents / Resources

	Valuetesters TVF Series Flow Display [pdf] User Guide TVF Series Flow Display, TVF Series, Flow Display, Display

References

- User Manual