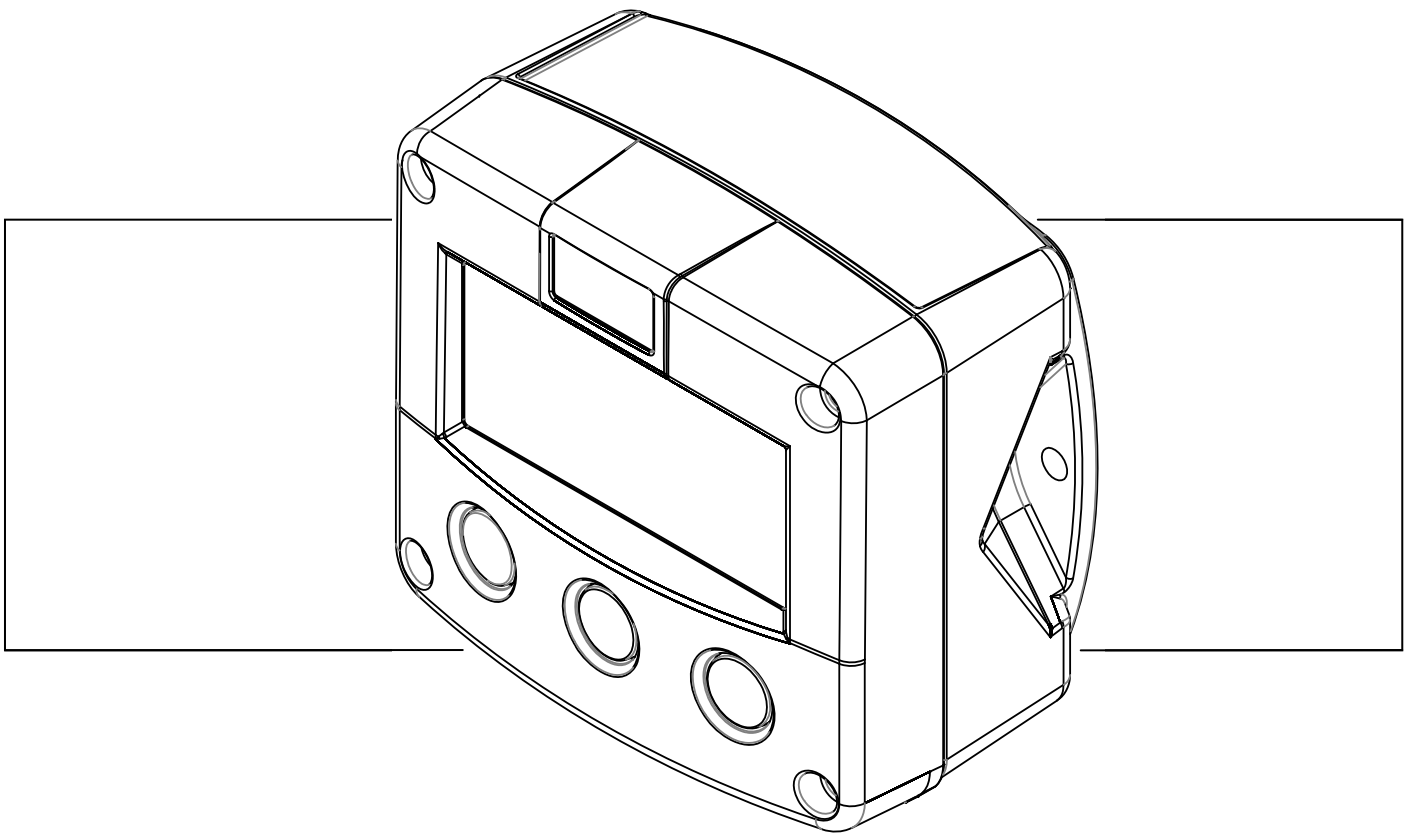


F193-X

MODBUS SLAVE DISPLAY



Signal input: Modbus RTU / ASCII

Signal outputs: 4-20mA and switch outputs

Option: Intrinsically Safe



SAFETY INSTRUCTIONS



- Any responsibility is lapsed if the instructions and procedures as described in this manual are not followed.
- **LIFE SUPPORT APPLICATIONS:** The F193-X is not designed for use in life support appliances, devices, or systems where malfunction of the product can reasonably be expected to result in a personal injury. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify the manufacturer and supplier for any damages resulting from such improper use or sale.
- **Electro static discharge does inflict irreparable damage to electronics! Before installing or opening the unit, the installer has to discharge himself by touching a well-grounded object.**
- **This unit must be installed in accordance with the EMC guidelines (Electro Magnetic Compatibility).**
- **Do connect a proper grounding to the aluminum casing as indicated if the F193-X has been supplied with the 115-230V AC power-supply type PM. The green / yellow wire between the back-casing and removable terminal-block may never be removed.**
- **Intrinsically Safe applications: follow the instructions as mentioned in Chapter 5 and consult “Fluidwell F1...-XI - Documentation for Intrinsic Safety”.**

DISPOSAL



At the end of its life this product should be disposed of according to local regulations regarding waste electronic equipment. If a battery is present in this product it should be disposed of separately. The separate collection and recycling of your waste equipment will help to conserve natural resources and ensure that it is recycled in a manner that protects the environment.

SAFETY RULES AND PRECAUTIONARY MEASURES

- The manufacturer accepts no responsibility whatsoever if the following safety rules and precautions instructions and the procedures as described in this manual are not followed.
- Modifications of the F193-X implemented without preceding written consent from the manufacturer, will result in the immediate termination of product liability and warranty period.
- Installation, use, maintenance and servicing of this equipment must be carried out by authorized technicians.
- Check the mains voltage and information on the manufacturer's plate before installing the unit.
- Check all connections, settings and technical specifications of the various peripheral devices with the F193-X supplied.
- Open the casing only if all leads are free of potential.
- Never touch the electronic components (ESD sensitivity).
- Never expose the system to heavier conditions than allowed according to the casing classification (see manufacture's plate and chapter 4.2.).
- If the operator detects errors or dangers, or disagrees with the safety precautions taken, then inform the owner or principal responsible.
- The local labor and safety laws and regulations must be adhered to.

ABOUT THE OPERATION MANUAL

This operation manual is divided into two main sections:

- The daily use of the unit is described in chapter 2 "Operation". This instruction is meant for users.
- The following chapters and appendices are exclusively meant for electricians/technicians. These provide an extensive description of all software settings and installing the hardware.

This operation manual describes the standard unit as well as most of the options available. For additional information, please contact your supplier.

A hazardous situation may occur if the F193-X is not used for the purpose it was designed for or is used incorrectly. Please carefully note the information in this operating manual indicated by the pictograms:



A "**warning**" indicates actions or procedures which, if not performed correctly, may lead to personal injury, a safety hazard or destruction of the F193-X or connected instruments.



Caution !

A "**caution**" indicates actions or procedures which, if not performed correctly, may lead to personal injury or incorrect function of the F193-X or connected instruments.



Note !

A "**note**" indicates actions or procedures which, if not performed correctly, may indirectly affect operation or may lead to an instrument response which is not planned.

Hardware version	:	02.01.xx
Software version	:	02.05.xx
Manual	:	HF193XEN_v0501_04
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Information in this manual is subject to change without prior notice. The manufacturer is not responsible for mistakes in this material or for incidental damage caused as a direct or indirect result of the delivery, performance or use of this material.

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1. INTRODUCTION

1.1. SYSTEM DESCRIPTION OF THE F193-X

Functions and features

The Modbus slave display model F193-X is a microprocessor driven instrument designed as local Modbus display with outputs which are controlled through communications as well. In total nine different product values can be displayed, maximum four alarm switch outputs and one analog output can be controlled.

This product has been designed with a focus on:

- ultra-low power consumption to allow long-life battery powered applications (type PB / PC),
- intrinsic safety for use in hazardous applications (type XI),
- several mounting possibilities with aluminum or GRP enclosures for harsh industrial surroundings,
- transmitting possibilities with analog / control and communication outputs.

Communication input

This manual describes the unit with a ASCII / RTU Modbus protocol input through a RS232 / RS485 (2-wire or 4 wire). No additional inputs are available, all data is coming through the communication.

Standard outputs

- Alarm output: up to four outputs can be controlled through the communication and in the mean time a alarm message can be displayed.
- (0)4-20mA / 0-10V analog output: any value within it's range can be transmitted through communication. The minimum and maximum signal output levels can be tuned.

For security reasons, it is also possible to enable and disable all outputs locally through the keyboard of the F193-X.

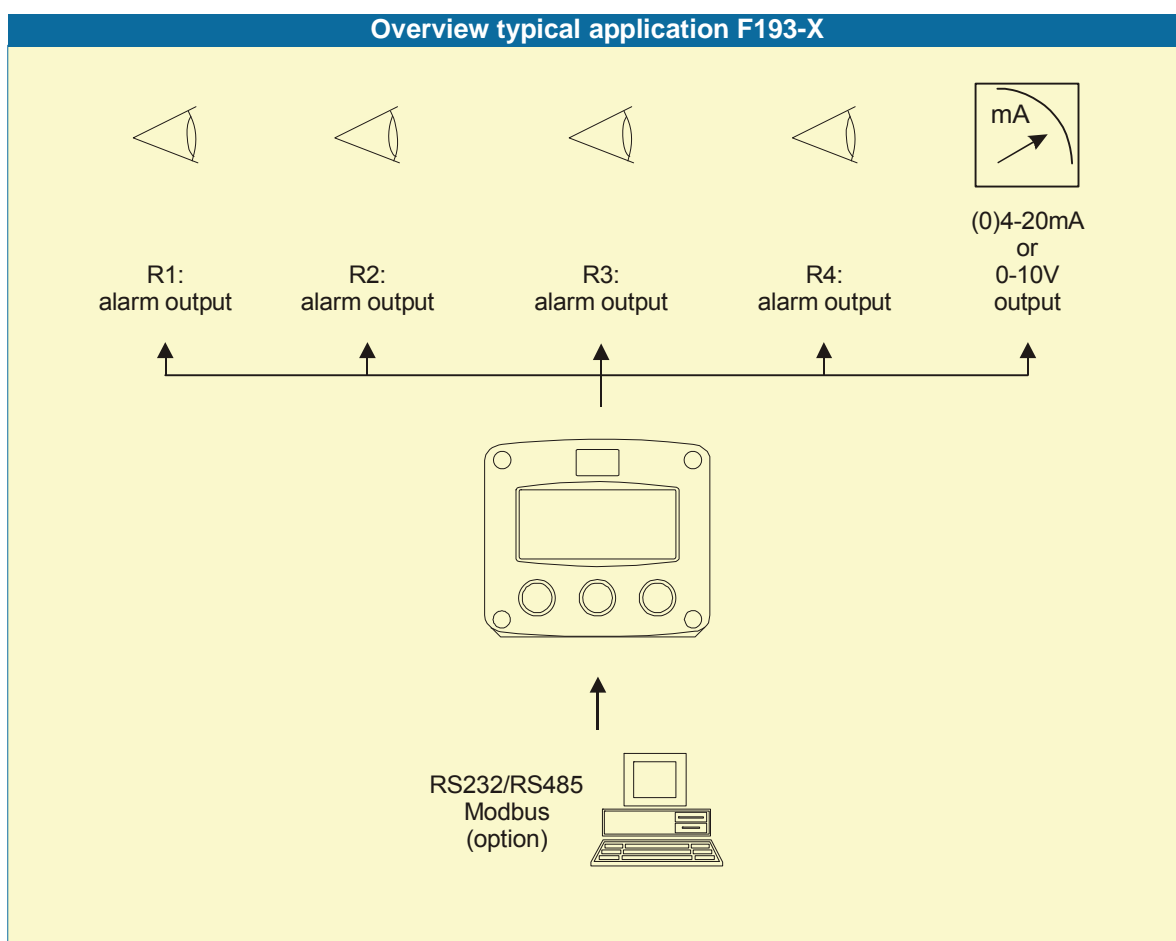


Fig. 1: Typical application for the F193-X.

Configuration of the unit

The F193-X is designed to be implemented in many types of applications. For that reason, a SETUP-level is available to configure your F193-X according to your specific requirements. SETUP includes several important features, such as communication speed, address, measurement units etc. All these settings can be modified through the communication as well.

All settings are stored in EEPROM memory and will not get lost in case of power break-down or empty battery.

To extend the battery-life time (option), please make use of the power-management functions as described in chapter 3.2.3.

Display information

The unit has a large transfective LCD with all kinds of symbols and digits to display measuring units, status information and key-word messages.

Options

Following options are available: isolated or active 4-20mA / 0-10V / 0-20mA analog output, full Modbus communication RS232/485 (also battery powered), intrinsic safety, mechanic relay or active outputs, power-supply options, panel-mount, wall-mount and weather-proof enclosures, flame proof enclosure.

2. OPERATIONAL

2.1. GENERAL



- *The F193-X may only be operated by personnel who are authorized and trained by the operator of the facility. All instructions in this manual are to be observed.*
- *Take careful notice of the " Safety rules, instructions and precautionary measures " in the front of this manual.*

This chapter describes the daily use of the F193-X. This instruction is meant for users / operators.

2.2. CONTROL PANEL

The following keys are available:

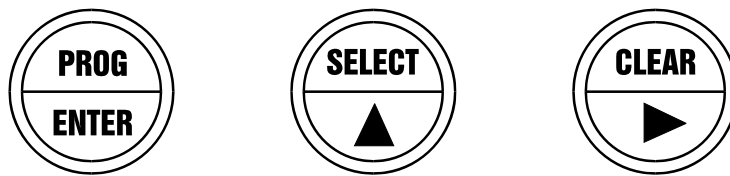


Fig. 2: Control Panel.

Functions of the keys



This key is used to program and save new values or settings.
It is also used to get access to SETUP-level; please read chapter 3.



This key is used to SELECT other products or tanks.
The arrow-key ▲ is used to increase a value after PROG has been pressed or to configure the unit; please read chapter 3.



Press this key to CLEAR an alarm.
The arrow-key ► is used to select a digit after PROG has been pressed or to configure the unit; please read chapter 3.

2.3. OPERATOR INFORMATION AND FUNCTIONS

In general, the F193-X will always act at Operator level. The information displayed is dependant up on the SETUP-settings. The screen refresh rate setting might be slow but after pressing a key, the display will be updated very quickly during a 30 second period, after which it will slow-down again.



Fig. 3: Example of display information during process.

For the Operator, the following functions are available:

- **Display products**
This is the main display information of the F193-X. After selecting any other information, it will always return to this main display automatically.
depending on the configuration settings, it is allowed to select one or more different products or the display will toggle automatically through all available product information.
- **Clear alarm**
In case an alarm is generated, it can simply be cleared by pressing the CLEAR button twice. It might however be that initialization is not possible and no other products can be selected due to configuration settings.
- **Low-battery alarm**
When the battery voltage drops, it must be replaced. At first "low-battery" will flash, but as soon as it is displayed continuously, the battery MUST be replaced shortly after!
Only original batteries supplied by the manufacturer may be used, else the guarantee and liability will be terminated. The remaining lifetime after the first moment of indication is generally several days up to some weeks.
- **Alarm 01-03**
When "alarm" is displayed, please consult Appendix B: problem solving.

3. CONFIGURATION

3.1. INTRODUCTION

This and the following chapters are exclusively meant for electricians and non-operators. In these, an extensive description of all software settings and hardware connections are provided.



Caution !

- *Mounting, electrical installation, start-up and maintenance of the instrument may only be carried out by trained personnel authorized by the operator of the facility. Personnel must read and understand this Operating Manual before carrying out its instructions.*
- *The F193-X may only be operated by personnel who are authorized and trained by the operator of the facility. All instructions in this manual are to be observed.*
- *Ensure that the measuring system is correctly wired up according to the wiring diagrams. The housing may only be opened by trained personnel.*
- *Take careful notice of the " Safety rules, instructions and precautionary measures " in the front of this manual.*

3.2. PROGRAMMING SETUP-LEVEL

3.2.1. GENERAL

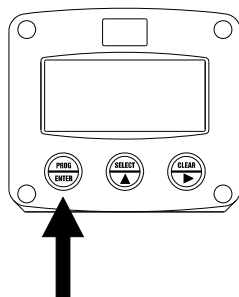
Configuration of the F193-X is done at SETUP-level. SETUP-level is reached by pressing the PROG/ENTER key for 7 seconds; at which time, both arrows \blacktriangle will be displayed. In order to return to the operator level, PROG will have to be pressed for three seconds. Alternatively, if no keys are pressed for 2 minutes, the unit will exit SETUP automatically. SETUP can be reached at all times while the F193-X remains fully operational.



Note !

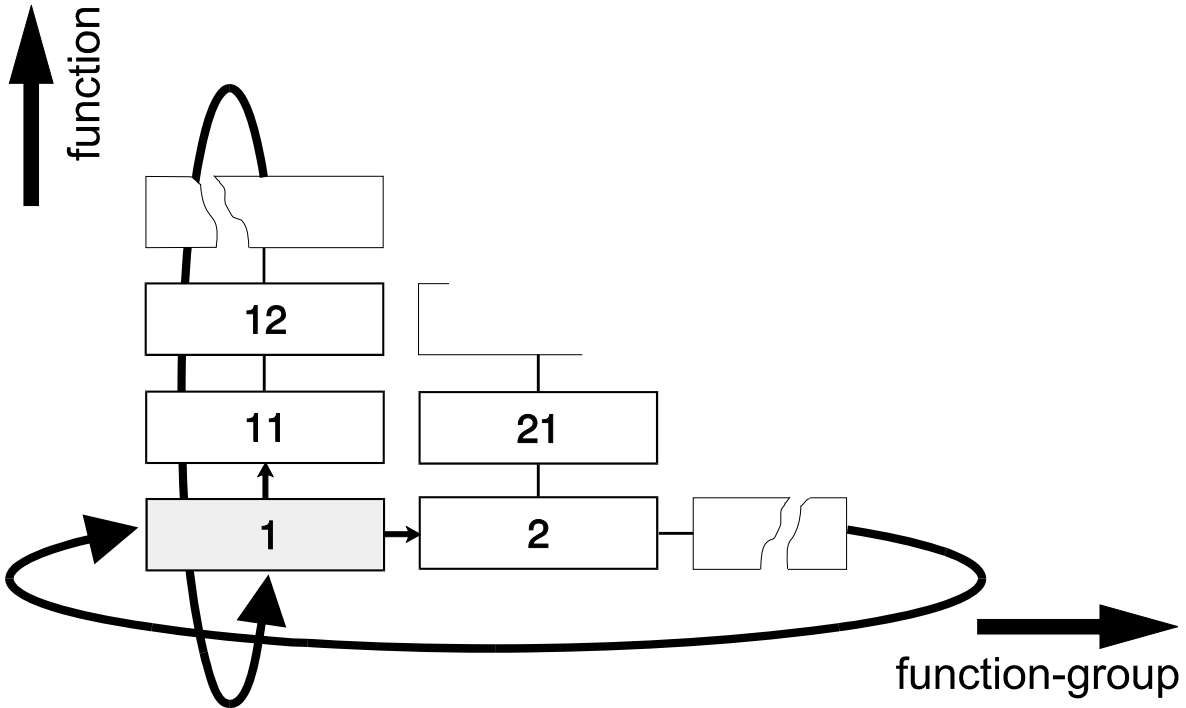
Note: A password may be required to enter SETUP. Without this password access to SETUP is denied.

To enter SETUP-level:



Press  for 7 seconds

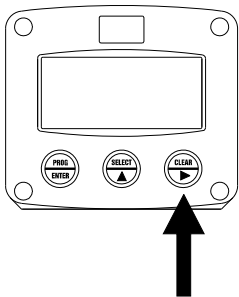
Matrix structure SETUP-level:



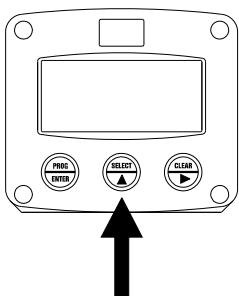
SCROLLING THROUGH SETUP-LEVEL

Selection function-group and function:

SETUP is divided into several function groups and functions.



Select function-group with



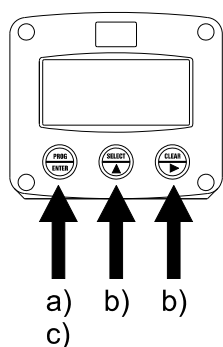
Select function with









Each function has a unique number, which is displayed below the word "SETUP" at the bottom of the display. The number is a combination of two figures. The first figure indicates the function-group and the second figure the function. Additionally, each function is expressed with a keyword.



After selecting a sub-function, the next main function is selected after scrolling through all "active" sub-functions (e.g. 1[▲], 11[▲], 12[▲], 13[▲], 14[▲], 1[▶], 2[▶], 3[▲], 31 etc.).



To change or a select a value or value:



- a) press  briefly; **PROGRAM** will start flash
- b) select or enter value with  and / or 
- c) press  to confirm the value / selection.

To change a value, use  to select the digits and  to increase that value.

To select a setting, both  and  can be used.

When the new value is not valid, the increase sign  or decrease-sign  will be displayed while you are programming.

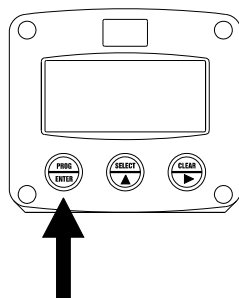
When data is altered but ENTER is not pressed, then the alteration can still be cancelled by waiting for 20 seconds or by pressing ENTER for three seconds: the PROG-procedure will be left automatically and the former value reinstated.



Note !

Note: alterations will only be set after ENTER has been pressed!

To return to OPERATOR-level:



Press  for 3 seconds

In order to return to the operator level, PROG will have to be pressed for three seconds. Also, when no keys are pressed for 2 minutes, SETUP will be left automatically.

3.2.2. OVERVIEW FUNCTIONS SETUP LEVEL

SETUP FUNCTIONS AND VARIABLES			
1	CONFIGURE		
	11	PRODUCTS	1 - 9
	12	DISPLAY	product - tank
	13	SCROLL	enable - disable
	14	TOGGLE	enable - disable
	15	ALARM OUTPUT	auto-on - auto-off
	16	CLEARING	enable - disable - relay
	17	DISPLAY	product - tank
2	UNITS		
	21	UNIT (product 1)	L - m3 - kg - lb - GAL - USGAL - bbl - no unit

	29	UNIT (product 9)	L - m3 - kg - lb - GAL - USGAL - bbl - no unit
3	DECIMALS		
	31	DECIMALS (product 1)	0 - 1 - 2 - 3 (Ref: displayed value)

	39	DECIMALS (product 9)	0 - 1 - 2 - 3 (Ref: displayed value)
4	OUTPUTS		
	41	OUTPUT (product 1)	relay 1 - relay 2 - relay 3 - relay 4 - none

	49	OUTPUT (product 9)	relay 1 - relay 2 - relay 3 - relay 4 - none
5	VALUES		
	51	VALUE (product 1)	0000.000 - 9,999,999 unit

	59	VALUE (product 9)	0000.000 - 9,999,999 unit
6	ALARM SET		
	61	ALARM (product 1)	on - off

	69	ALARM (product 9)	on - off
7	RELAY SET		
	71	RELAY 1	on - off
	72	RELAY 2	on - off
	73	RELAY 3	on - off
	74	RELAY 4	on - off
8	POWER MANAGEMENT		
	81	LCD UPDATE	fast - 1 sec - 3 sec - 15 sec - 30 sec - off
	82	BATTERY MODE	operational - shelf
9	ANALOG		
	91	OUTPUT	disable - enable
	92	OUTPUT MINIMUM	0000.000 - 9,999,999
	93	OUTPUT MAXIMUM	0000.000 - 9,999,999
	94	OUTPUT SET VALUE	0000.000 - 9,999,999
	95	TUNE MIN - 4mA / 0V	0 - 9,999
	96	TUNE MAX- 20mA / 10V	0 - 9,999
	97	FILTER	00 - 99
A	COMMUNICATION		
	A1	SPEED / BAUDRATE	1200 - 2400 - 4800 - 9600
	A2	ADDRESS	1 - 255
	A3	MODE	rtu - off
	A4	TIME OUT	0.0 - 999.9 sec
B	OTHERS		
	B1	TYPE / MODEL	0193
	B2	SOFTWARE VERSION	02.04.xx
	B3	SERIAL NO.	xxxxxxx
	B4	PASSWORD	0000 - 9999
	B5	TAGNUMBER	0000000 - 9999999

3.2.3. EXPLANATION SETUP-FUNCTIONS

All functions described below can be read and modified through communication. However, it is also desired for the initial setup and for safety reason that all settings and data can be modified manually. The functions below do offer all these settings and data.

1 - CONFIGURE			
PRODUCTS 11	Do select the number of products to be available for the operator: Following can be selected: 1 - 9.		
0x060C	1 byte	0=one product 2=two products 8=nine products	
DISPLAY 12	This function determines the displayed name for the operator. Following can be selected: product – tank		
0x061E	1 byte	0=product 1=tank	
SCROLL LOCK 13	This function disables the “select” but on operator level. The operator is no longer able to select another product. This allows the communication to determine which information is displayed. Please note: this function does not disable the toggle function (setting 13) Following can be selected: disable - enable		
0x060E	1 byte	0=disable 1=enable	
TOGGLE 14	The actual values of the products can be selected manually or automatically. If scroll is enabled, the next product will be displayed every four seconds. Following can be selected: disable - enable		
0x060B	1 byte	0=disable 1=enable	
ALARM OUTPUT 15	With setting 6, an alarm can be generated for a product. With setting 7, an output can be switched to transmit the alarm condition. This are two communication commands to achieve an alarm output. However, if setting 14 is set to “auto_on”, the assigned output (setup 4) will be switched automatically in case of an alarm. Following can be selected: auto on - auto off		
0x060D	1 byte	0=auto_off 1=auto_on	
CLEARING AN ALARM 16	It might be required to have an operator interaction to terminate an alarm condition, e.g. for security reasons. This setting determines how an alarm will be determined. Following can be selected: enable - disable - relay enable: the alarm can be cleared and the alarm output will be switched-off disable: the alarm and alarm output can NOT be cleared by the operator. relay: the alarm output can be cleared by the operator but not the alarm message on the display.		
0x060A	1 byte	0=auto_off 1=auto_on	

2 - UNIT

MEASUREMENT UNIT PRODUCT X 21 - 29	SETUP 21-29 determines for product 1 up to and including product 9 the displayed measurement unit. The following units can be selected: L - m3 - kg - lb. - GAL - USGAL - bbl - _ (no unit).		
0x0604 product 1 0x0614 product 2 0x0624 product 3 0x0634 product 4 0x0644 product 5 0x0654 product 6 0x0664 product 7 0x0674 product 8 0x0684 product 9	1 byte	0=L 1=m3 2=kg 3=lb 4=gal 5=usgal 6=bbl 7=none	

3 - DECIMALS

DECIMALS PRODUCT X 31 - 39	SETUP 31-39 determines for product 1 up to and including product 9 the number of decimals displayed. The following units can be selected: 0000000 - 111111.1 - 22222.22 - 3333.333		
0x0605 product 1 0x0615 product 2 0x0625 product 3 0x0635 product 4 0x0645 product 5 0x0655 product 6 0x0665 product 7 0x0675 product 8 0x0685 product 9	1 byte	0=0 decimals 1=1 decimal 2=2 decimals 3=3 decimals	

4 - OUTPUTS

OUTPUTS - ALARM PRODUCT X 41 - 49	SETUP 41-49 assigns for product 1 up to and including product 9 the alarm output to be switched in case of an alarm (setup 6). Please read also setup 14. The following units can be selected: relay 1 - relay 2 - relay 3 - relay 4 - none		
0x0606 product 1 0x0616 product 2 0x0626 product 3 0x0636 product 4 0x0646 product 5 0x0656 product 6 0x0666 product 7 0x0676 product 8 0x0686 product 9	1 byte	0=none (disabled) 1=relay 1 2=relay 2 3=relay 3 4=relay 4	

5 - VALUE			
VALUE DISPLAYED PRODUCT X 51 - 59	SETUP 51-59 determines for product 1 up to and including product 9 the displayed value. The minimum value is 0 and the maximum value is seven digits.		
0x0600 product 1 0x0610 product 2 0x0620 product 3 0x0630 product 4 0x0640 product 5 0x0650 product 6 0x0660 product 7 0x0670 product 8 0x0680 product 9	3 bytes	0.000 ... 9999999	

6 - ALARM SET			
ALARM SET PRODUCT X 61 - 69	SETUP 61-69 determines for product 1 up to and including product 9 if an alarm has to be triggered. Depending on setting 14 and 4X the assigned alarm output will be switched.		
	The following units can be selected: on - off		
0x0607 product 1 0x0617 product 2 0x0627 product 3 0x0637 product 4 0x0647 product 5 0x0657 product 6 0x0667 product 7 0x0677 product 8 0x0687 product 9	1 byte	0=off 1=on	

7 - RELAY OUTPUT			
RELAY OUTPUT PRODUCT X 71 - 74	SETUP 71-74 controls the outputs directly. Depending on the hardware configuration, there are 2, 3 or 4 outputs available. The output can also be switched automatically in case of an alarm; please read setup 14 and 4X. Please note: this function overrules an enabled output due to the automatic alarm (setup14 and 4X).		
	The following units can be selected: on - off		
0x0609 relay 1 0x0619 relay 2 0x0629 relay 3 0x0639 relay 4	1 byte	0=off 1=on	

8 - POWER MANAGEMENT

When used with the internal battery option type PB / PC, the user may hold the concern of reliable display over a long period of time. The F193-X has several smart power management functions to extend the battery life time significantly. Two of these functions can be set:

LCD NEW 81

The calculation of the display-information influences the power consumption significantly. When the application does not require a fast display update, it is **strongly advised** to select a slow refresh-rate. Please understand that new information will first be displayed after the next display update. The following can be selected:

Fast - 1 sec - 3 sec - 15 sec - 30 sec - off.

Note: after a button has been pressed by the operator - the display refresh-rate will always be FAST during 30 seconds. When "OFF" is selected, the display will be switched-off after 30 seconds and will be switched-on as soon as a button has been pressed.

0x0050

1 byte

0=fast
1=1sec
2=3sec
3=15sec
4=30sec
5=off



Note !

BATTERY-MODE 82

The unit has two modes: operational or shelf. After "shelf" has been selected, the unit can be stored fully configured but it will not be operational. In this mode, power consumption is extremely low. To wake-up the unit again; press the SELECT-key twice.

0x0051

1 byte

0=operational
1=shelf

9 - ANALOG OUTPUT

A linear (0)4-20mA or 0-10V output signal is generated with these functions with a 10 bits resolution. The value transmitted is set with setup 94. When a power supply is available but the output is disabled, a 3.5mA signal will be generated.

DISABLE / ENABLE 91

The analog output can be disabled. In case of a passive analog output type AP, 3.5mA will be generated if a power supply is available but the output is disabled.

0x0070

1 byte

0=disable
1=enable

MINIMUM VALUE 92

Enter here the minimum value according which the output should generate a (0)4mA or 0V signal.

0x0071

3 bytes

0 ... 9999999

MAXIMUM VALUE 93

Enter here the minimum value according which the output should generate a 20mA or 10V signal.

0x0074

3 bytes

0 ... 9999999

SET VALUE 94

This is the transmitted value which should be in the range as set with setup 92 and 93.

0x00C8

3 bytes

0 ... 9999999

TUNE MIN / 4MA 95	The initial minimum analog output value is 0/4mA or 0V. However, this value might differ slightly due to external influences such as temperature for example. The 0/4mA or 0V value can be tuned precisely with this setting.		
	<ul style="list-style-type: none"> ▪ <i>Before tuning the signal, be sure that the analog signal is not being used for any application!</i> <p>After pressing PROG, the current will be about 4mA (or 0mA / 0V). The current can be increased / decreased with the arrow-keys and is <u>directly active</u>. Press ENTER to store the new value. Remark: the analog output value can be programmed “up-side-down” if desired, so 20mA at minimum minium signal for example!</p>		
0x0078	2 bytes	0..9999	



TUNE MAX / 20MA 96	The initial maximum analog output value is 20mA (or 10V). However, this value might differ slightly due to external influences such as temperature for example. The 20mA value (or 10V) can be tuned precisely with this setting.		
	<ul style="list-style-type: none"> ▪ <i>Before tuning the signal, be sure that the analog signal is not being used for any application!</i> <p>After pressing PROG, the current will be about 20mA. The current can be increased / decreased with the arrow-keys and is <u>directly active</u>. Press ENTER to store the new value. Remark: the analog output value can be programmed “up-side-down” if desired, so 4mA at maximum signal for example!</p>		
0x007A	2 bytes	0..9999	



FILTER 97	This function is used to slow down a value change as set with 94. The output value is update every 0.1 second. With the help of this digital filter a smooth but less quick reading can be obtained. The higher the filter level, the longer the response time on a value change will be. Below, several filter levels with there response times are indicated:			
	FILTER VALUE	RESPONSE TIME ON STEP CHANGE OF ANALOG VALUE.		
	TIME IN SECONDS			
	50% INFLUENCE	75% INFLUENCE	90% INFLUENCE	99% INFLUENCE
01	filter disabled	filter disabled	filter disabled	filter disabled
02	0.1 second	0.2 second	0.4 second	0.7 second
03	0.2 second	0.4 second	0.6 second	1.2 seconds
05	0.4 second	0.7 second	1.1 seconds	2.1 seconds
10	0.7 second	1.4 seconds	2.2 seconds	4.4 seconds
20	1.4 seconds	2.8 seconds	4.5 seconds	9.0 seconds
30	2.1 seconds	4 seconds	7 seconds	14 seconds
50	3.5 seconds	7 seconds	11 seconds	23 seconds
75	5.2 seconds	10 seconds	17 seconds	34 seconds
99	6.9 seconds	14 seconds	23 seconds	45 seconds
0x0063	1 byte	0...99		

A - COMMUNICATION (OPTIONAL)			
BAUDRATE A1	Following communication speeds can be selected: 1200 - 2400 - 4800 - 9600 baud		
0x000A	2 bytes	0=1200 1=2400 2=4800 3=9600	
BUS ADDRESS A2	For communication purposes, a unique identity can be attributed to every F193-X. This address can vary from 1-255.		
0x0009	1 byte	1..255	
MODE A3	The communication can only be executed according Modbus protocol ASCII or RTU mode. With OFF, the communication is disabled.		
0x000B	1 byte	0=ASCII 1=RTU 2=off	
TIME OUT A4	To monitor the communication link with the Modbus master, a time out can be determined. If no comm's has taken place within this time, the text "NO COMM'S" will be displayed at operator level. The following time can be entered: 0.0 – 999.9 seconds. With value 0.0, this function is disabled.		
0x00CD	2 bytes	1...9, 999	
B - OTHERS			
TYPE OF MODEL B1	For support and maintenance it is important to have information about the characteristics of the F193-X. Your supplier will ask for this information in the case of a serious breakdown.		
0x0001	2 bytes	193	read only
VERSION SOFTWARE B2	For support and maintenance it is important to have information about the characteristics of the F193-X. Your supplier will ask for this information in the case of a serious breakdown.		
0x0004	4 bytes	xxxxxx	read only
SERIAL NUMBER B3	For support and maintenance it is important to have information about the characteristics of the F193-X. Your supplier will ask for this information in the case of a serious breakdown.		
0x0002	4 bytes	xxxxxxxx	read only
PASSWORD B4	All SETUP-values can be password protected. This protection is disabled with value 0000 (zero). Up to and including 4 digits can be programmed, for example 1234.		
0x00A8	2 bytes	0..9999	
TAGNUMBER B5	For identification of the unit and communication purposes, a unique tagnumber of maximum 7 digits can be entered.		
0x00AA	4 bytes	0..9999999	

3.2.4. ADDITIONAL COMMUNICATION FUNCTIONS

PRODUCT DISPLAYED	This register determines the product currently displayed.		
0x060F	2 bytes	0=product 1 1=product 2 2=product 3 3=product 4 4=product 5 5=product 6 6=product 7 7=product 8 8=product 9	
ALARM STATUS (BITFIELD)	<p>This register contains a bitfield with the packed variable data of registers 0x0607 ... 0x0687 and can be used to read and write the alarm-status of all products simultaneously:</p> <p>Bit 0: alarm-status of product 1 (0 = off, 1 = on) Bit 1: alarm-status of product 2 (0 = off, 1 = on)</p> <p>This means that bit 0 (0x0001) indicates the alarm-status of product 1. If the bit is reset (0), the alarm is reset, if the bit is set (1) the alarm is set. The following bits in the bitfield correspond with the following products:</p> <p>E.g. writing a value of 0x0015 would result in setting the alarm-status for products 1, 3 and 5, and resetting the alarm-status for products 2, 4, 6, 7, 8 and 9.</p>		
0x061A	2 bytes	Product 1: bit 0 (0x0001) Product 2: bit 1 (0x0002) Product 3: bit 2 (0x0004) Product 4: bit 3 (0x0008) Product 5: bit 4 (0x0010) Product 6: bit 5 (0x0020) Product 7: bit 6 (0x0040) Product 8: bit 7 (0x0080) Product 9: bit 8 (0x0100)	
RELAY OUTPUTS (BITFIELD)	<p>This register contains a bitfield with the packed variable data of registers 0x0609 ... 0x0639 and can be used to read and write the relay outputs simultaneously:</p> <p>E.g. writing a value of 0x0005 would result in setting relay 1 and 3, and resetting relay 2 and 4.</p>		
0x061C	2 bytes	Bit 0: relay 1 (0 = off, 1 = on) Bit 1: relay 2 (0 = off, 1 = on) Bit 2: relay 3 (0 = off, 1 = on) Bit 3: relay 4 (0 = off, 1 = on)	

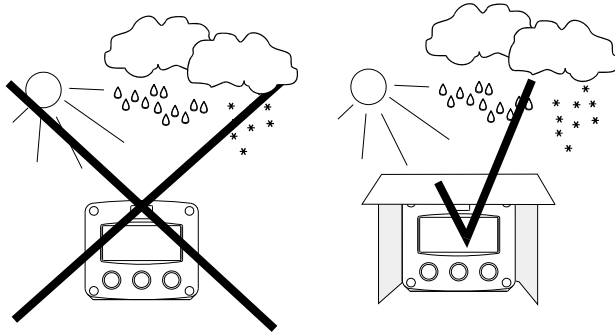
4. INSTALLATION



4.1. GENERAL DIRECTIONS

- Mounting, electrical installation, start-up and maintenance of this instrument may only be carried out by trained personnel authorized by the operator of the facility. Personnel must read and understand this Operating Manual before carrying out its instructions.
- The F193-X may only be operated by personnel who are authorized and trained by the operator of the facility. All instructions in this manual are to be observed.
- Ensure that the measuring system is correctly wired up according to the wiring diagrams. Protection against accidental contact is no longer assured when the housing cover is removed or the panel cabinet has been opened (danger from electrical shock). The housing may only be opened by trained personnel.
- Take careful notice of the " Safety rules, instructions and precautionary measures " at the front of this manual.

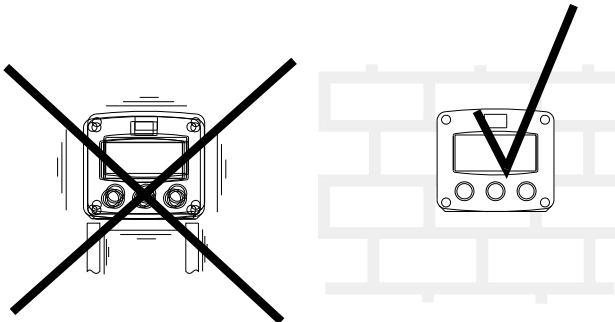
4.2. INSTALLATION / SURROUNDING CONDITIONS



Take the relevant IP classification of the casing into account (see manufactures plate). Even an IP67 (NEMA 4X) casing should NEVER be exposed to strongly varying (weather) conditions.

When panel-mounted, the unit is IP65 (NEMA 4X)!

When used in very cold surroundings or varying climatic conditions, take the necessary precautions against moisture by placing a dry sachet of silica gel, for example, inside the instrument case.



Mount the F193-X on a solid structure to avoid vibrations.

4.3. DIMENSIONS- ENCLOSURE

Aluminum enclosures:

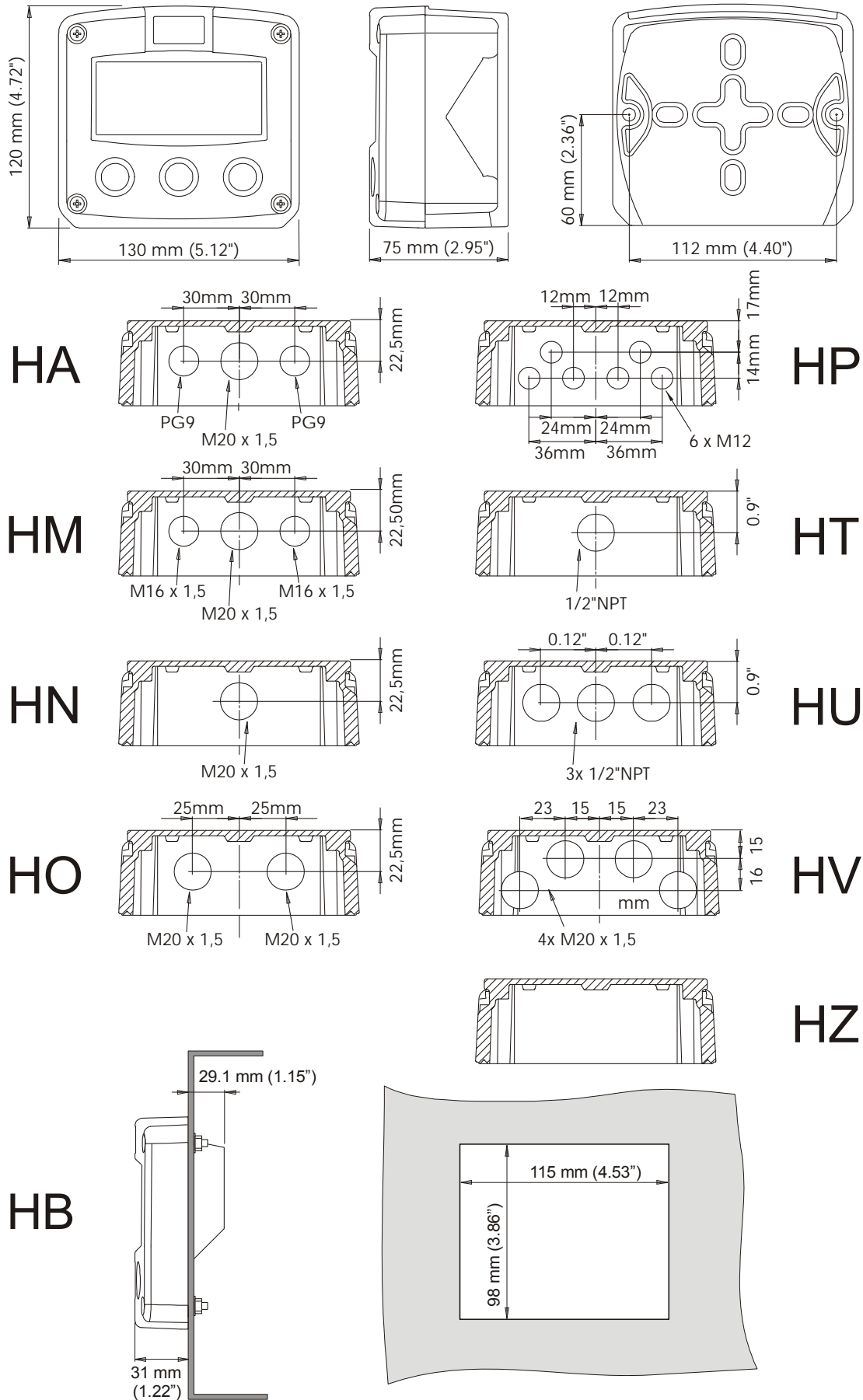
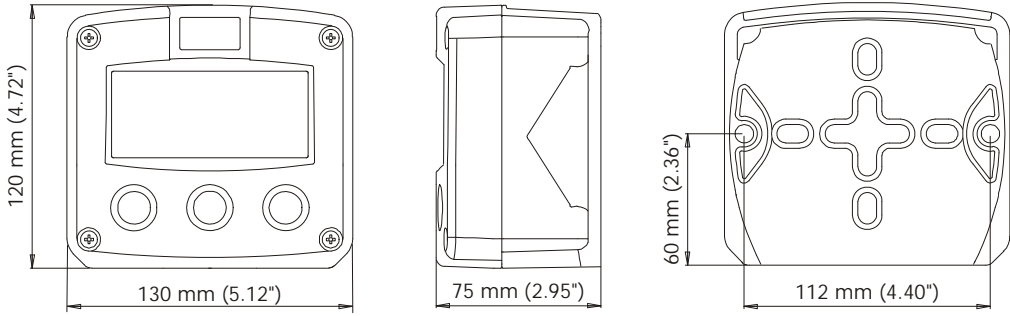
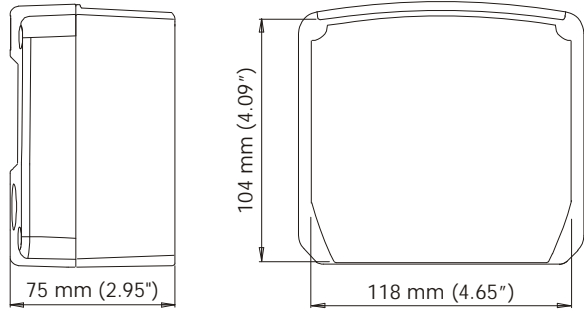


Fig. 4: Dimensions aluminum enclosures.

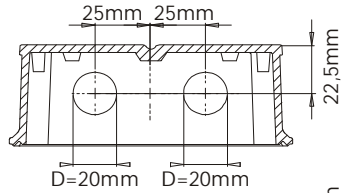
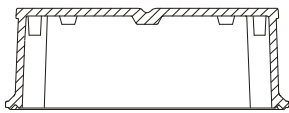
GRP enclosures:



HK back box:
(flat bottom)

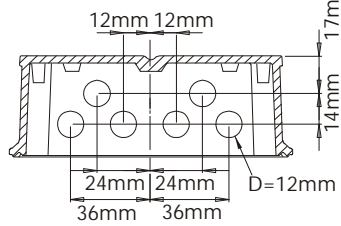
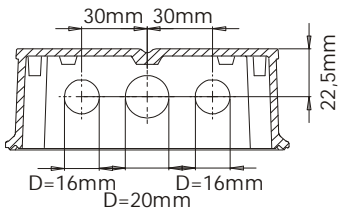


HD
HK



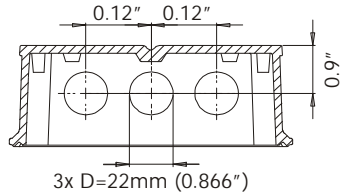
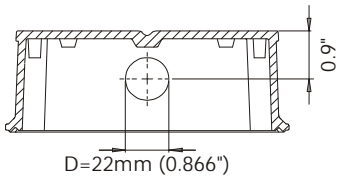
HG

HE



HH

HF



HJ

HC

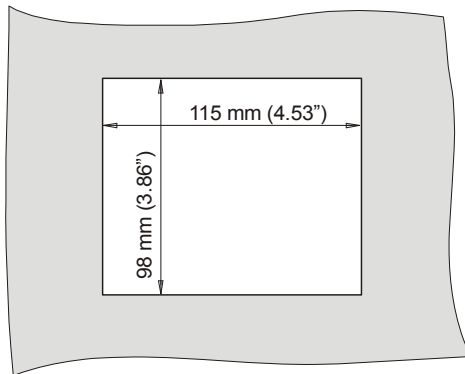
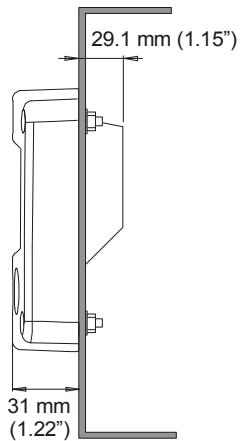


Fig 5: Dimensions GRP enclosures.

4.4. INSTALLING THE HARDWARE



4.4.1. INTRODUCTION

- Electro static discharge does inflict irreparable damage to electronics! Before installing or opening the unit, the installer has to discharge himself by touching a well-grounded object.
- This unit must be installed in accordance with the EMC guidelines (Electro Magnetic Compatibility).



Aluminum enclosures

- When installed in an aluminum enclosure and a potentially explosive atmosphere requiring apparatus of equipment protection level Ga and Da, the unit must be installed such that, even in the event of rare incidents, an ignition source due to impact or friction sparks between the enclosure and iron/steel is excluded.
- Do ground the aluminum enclosure properly as indicated, if the F193-X has been supplied with the 115-230V AC power-supply type PM. The green / yellow wire between the back-casing and removable terminal-block may never be removed.

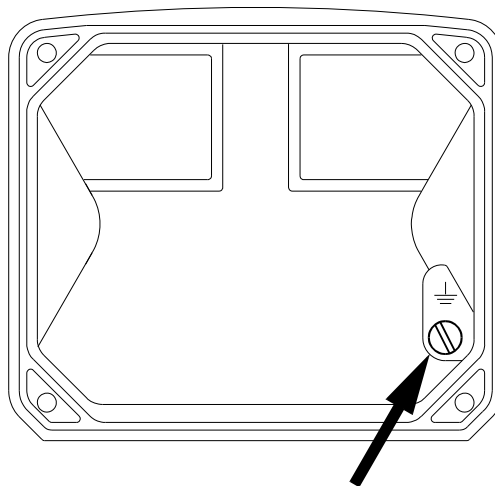


Fig. 6: Grounding aluminum enclosure with type PM 115-230V AC.

FOR INSTALLATION, PAY EMPHATIC ATTENTION TO:

- Separate cable glands with effective IP67 (NEMA4X) seals for all wires.
- Unused cable entries: ensure that you fit IP67 (NEMA4X) plugs to maintain rating.
- A reliable ground connection for both the sensor, and if applicable, for the metal casing.
- An effective screened cable for the input signal, and grounding of its screen to terminal 9 (GND) or at the sensor itself, whichever is appropriate to the application.

4.4.2. TERMINAL CONNECTORS

For *Intrinsically Safe* applications: read chapter 5.

The following terminal connectors are available:

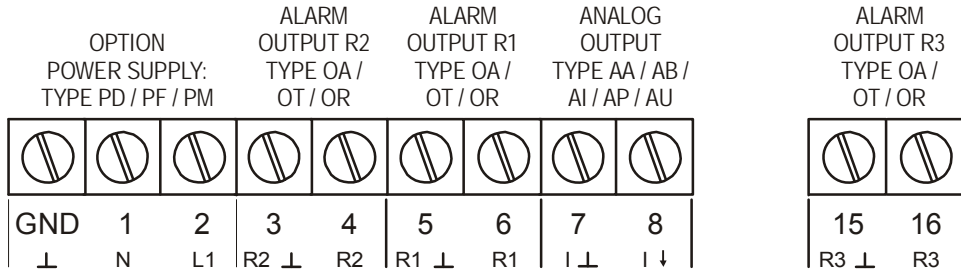


Fig. 7: Overview of terminal connectors standard configuration F193-X and options.

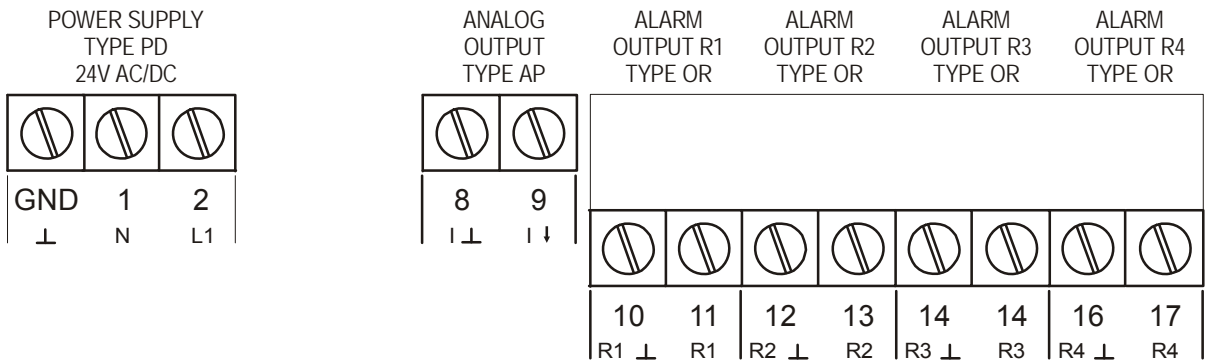


Fig. 8: Overview of terminal connectors F193-X-OS and options.

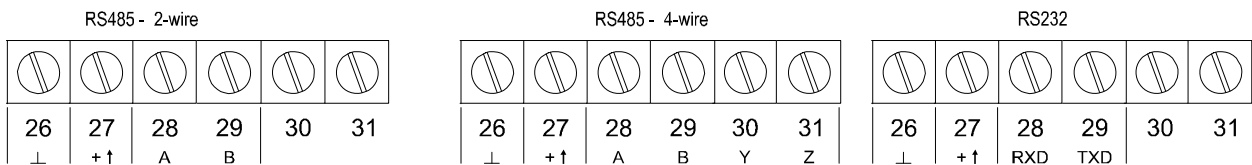


Fig. 9: Overview communication connectors.

REMARKS: TERMINAL CONNECTORS:

Terminal GND- 01- 02 only available with type PD / PF or PM:

TYPE	SENSOR SUPPLY	Terminal			backlight	TYPE AA	TYPE AU	Type OA	Type OR
		GND	01	02					
PD 8-24V AC	Not available		AC	AC	◇	◇	◇		
PD 8-30V DC	Not available	L-	L+		◇	◇	◇		
PF 24V AC ± 15%	Not available		AC	AC	◇	◇		◇	
PF 24V DC ± 15%	Not available	L-	L+		◇	◇		◇	
PM 115-230V AC ± 15%	Not available	EARTH	AC	AC	◇	◇	◇	◇	
Note PD	do not use a AC autotransformer (Spartrafo) without a galvanic isolation.								
Note PF / PM	The total consumption of the sensors and outputs may not exceed 400mA@24V								

◇=option



Note !

Note: for power supply type PX: please read Terminal 07-08 !

For Intrinsically Safe applications: read chapter 5.

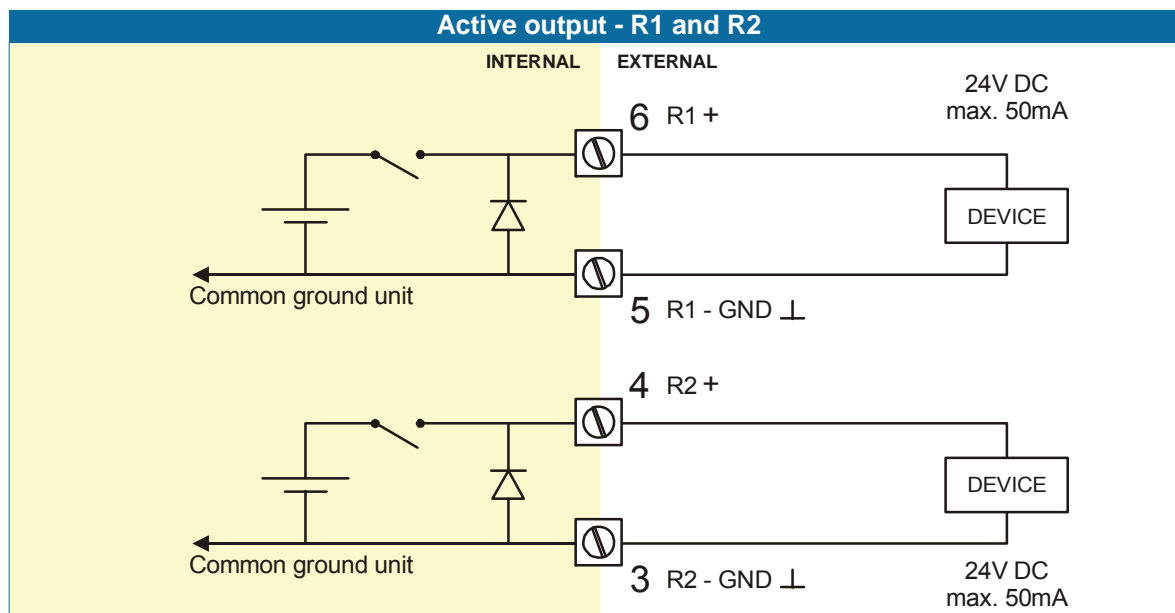
Terminal 03-06; alarm output R1 and R2:

Setup 4 and 7 (par. 3.4.4.) determines the function of these outputs.

Type OA:

An active 24V DC signal alarm output is available with this option.

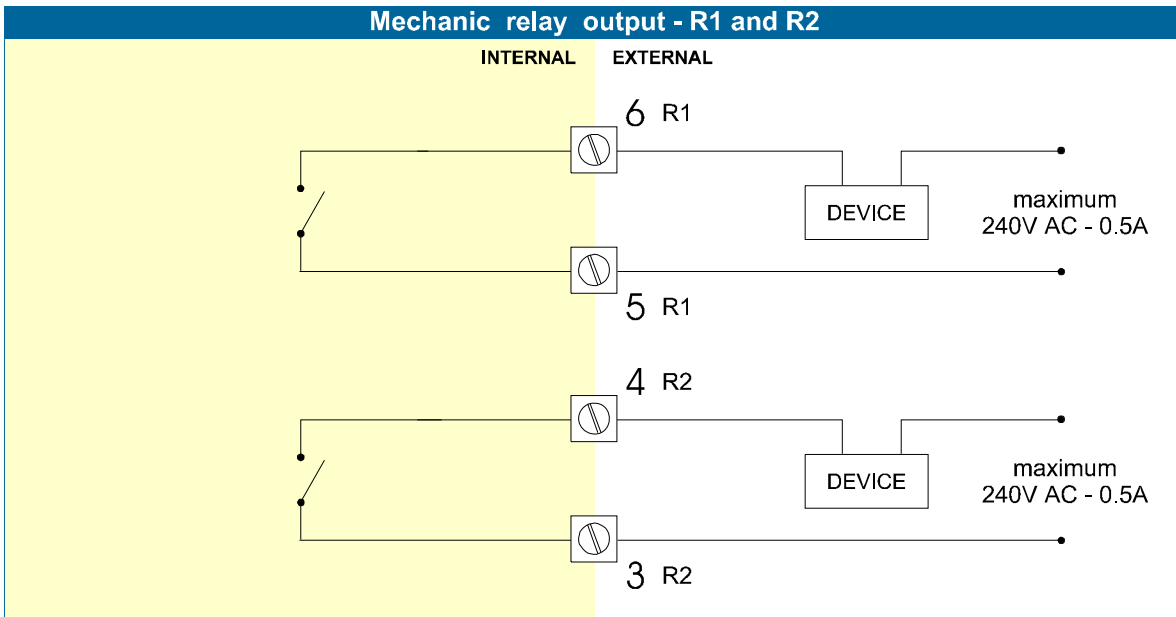
Max. driving capacity 50mA@24V per output. (Requires power supply type PD / PF / PM).



Type OR:

A mechanical relay output is available with this option.

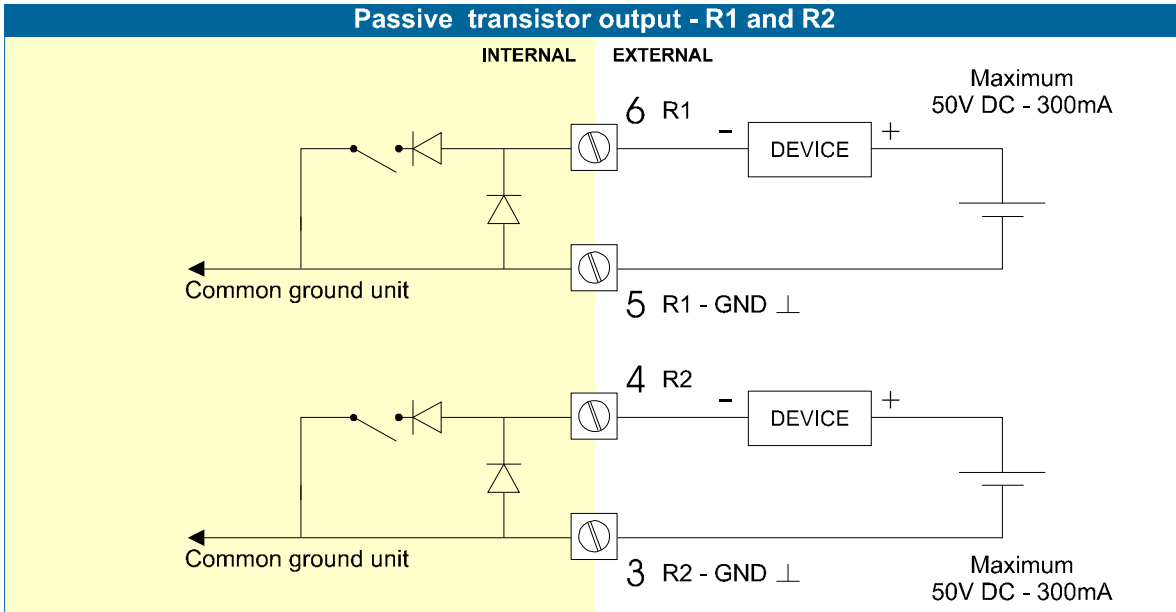
Max. switch power 240V 0,5A per output. (Requires power supply type PF / PM).



Type OT:

A passive transistor output is available with this option.

Max. driving capacity 300mA - 50V DC per output.



Terminal 07-08; basic POWER SUPPLY - type PX - output loop powered:

Connect an external power supply of 8-30VDC to these terminals or a 4-20mA loop.

Do not connect the "-" to terminal 7 and the "+" to terminal 8. When power is applied to these terminals, the (optional) internal battery will be disabled / enabled automatically to extend the battery life time.



Caution! *Only valid for standard passive output type AP!*

Terminal 07-08; analog output:

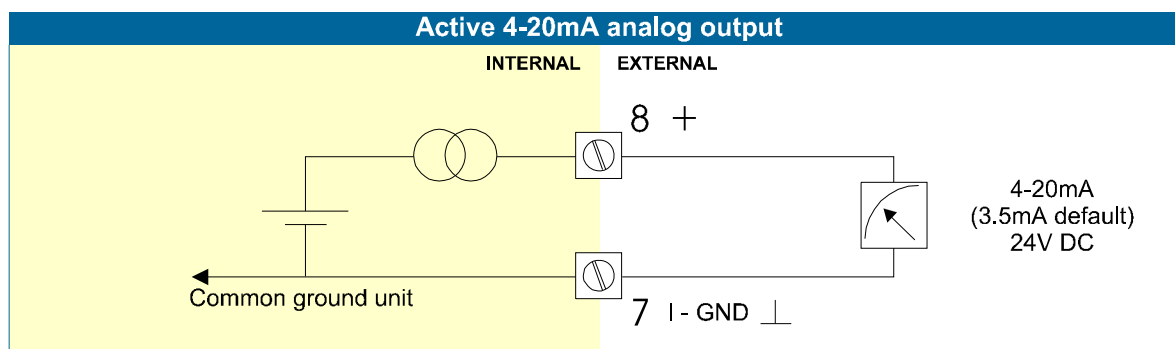
An analog output signal is generated according to the communication values and SETUP 9.

Type AA:

An active 4-20mA signal is available with this option.

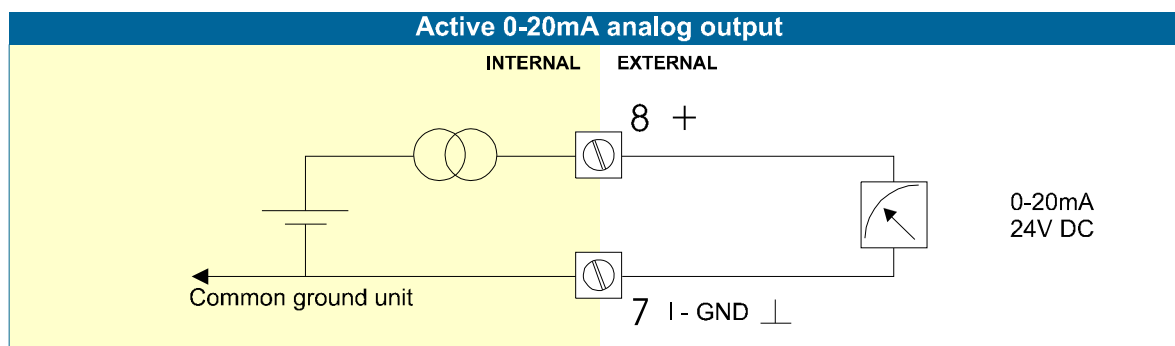
When the output is disabled, a 3.5mA signal will be generated on these terminals.

Max. driving capacity 1000 Ohm @ 24VDC. (Requires power supply type PD / PF / PM).

**Type AB:**

An active 0-20mA signal is available with this option.

Max. driving capacity 1000 Ohm @ 24VDC. (Requires power supply type PD / PF / PM).

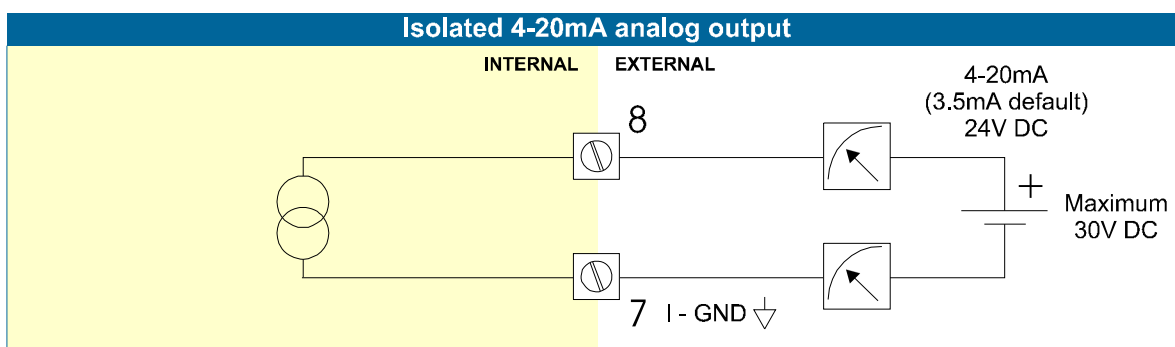
**Type AI:**

An isolated 4-20mA signal is available with this option.

When the output is disabled, a 3.5mA signal will be generated on these terminals.

Max. driving capacity 1000 Ohm @ 30VDC.

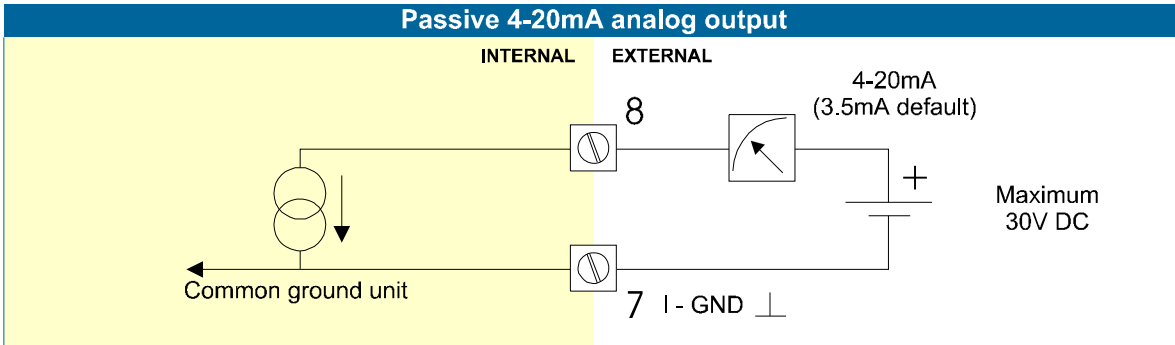
This option can be battery powered but the life time of the battery is about 2 -3 years.



Type AP:

A passive 4-20mA signal proportional is available with this option. When a power supply is connected but the output is disabled, a 3.5mA signal will be generated.

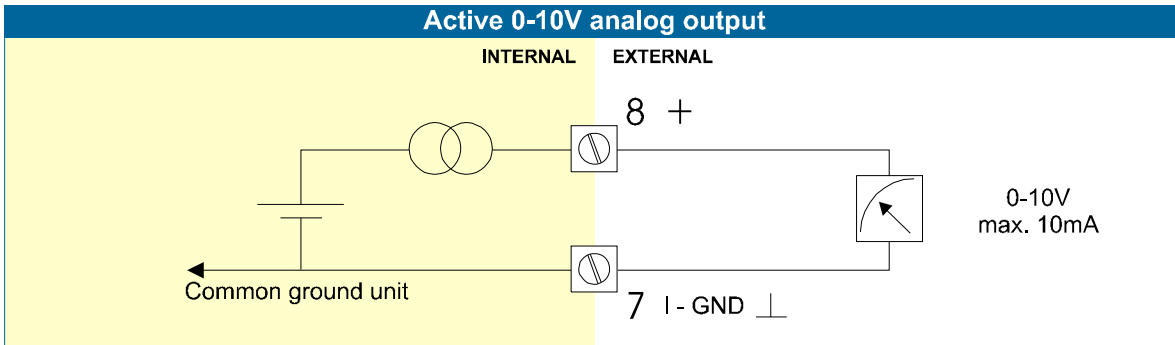
Max. driving capacity 1000 Ohm. This output does loop power the unit as well (type PX).



Type AU:

A 0-10VDC signal is available with this option.

Max. load 10mA @ 10VDC. (Requires power supply type PD / PF / PM).



Terminal 26-31: type CB / CH / CI / CT - communication RS232 / RS485 / TTL (option)

- Full serial communications and computer control in accordance with RS232 (length of cable max. 15 meters) or RS485 (length of cable max. 1200 meters) is possible.
- Read the Modbus communication protocol and Appendix C.

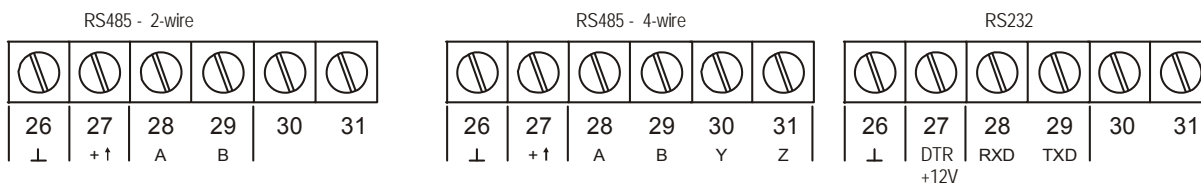


Fig. 10: Overview terminal connectors communication option.

When using the RS232 communication option, terminal 27 is used for supplying the interface. Please connect the DTR (or the RTS) signal of the interface to this terminal and set it active (+12V). If no active signal is available it is possible to connect a separate supply between terminals 26 and 27 with a voltage between 8V and 24V.

Terminal 26-31: backlight - type ZB (option):



Note: if the unit is supplied with a power supply type PD, PF or PM, the backlight supply is integrated, so the text following is not applicable.

To power the backlight, provide a 12-24V DC to terminal 26 (-) and 27 (+). An external trimmer 1kOhm trimmer can be used to tune the brightness of the backlight, or if not desired, a short-cut between these terminals have to be made which will result in the maximum brightness.



Note: Intrinsically Safe as well as 4-wire RS485 communication is not possible in combination with type ZB.

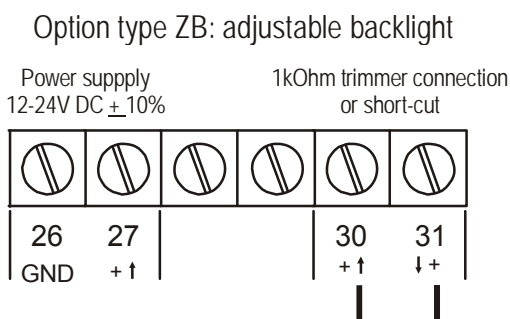


Fig. 11: Overview terminal connectors backlight option.

5. INTRINSICALLY SAFE APPLICATIONS

5.1. GENERAL INFORMATION AND INSTRUCTIONS



Caution !

Cautions

- Mounting, electrical installation, start-up and maintenance of this device may only be carried out by trained personnel authorized by the operator of the facility. Personnel must read and understand this Operating Manual before carrying out its instructions.
- This device may only be operated by personnel who are authorized and trained by the operator of the facility. All instructions in this manual are to be observed.
- Ensure that the measuring system is correctly wired up according to the wiring diagrams. Protection against accidental contact is no longer assured when the housing cover is removed or the cabinet has been opened (danger of electric shock). The housing may only be opened by trained personnel.
- To maintain the degree of protection of at least IP65 in accordance with IEC 60529, certified cable entries in accordance with IEC 61241-0 must be used and correctly installed. Unused openings must be closed with suitable blanking elements.
- When the enclosure of the Indicator is made of aluminum alloy, when used in a potentially explosive atmosphere requiring apparatus of equipment protection level Ga and Da, the unit must be installed such that, even in the event of rare incidents, an ignition source due to impact or friction sparks between the enclosure and iron/steel is excluded.
- Take careful notice of the " Safety rules, instructions and precautionary measures " in the front of this manual.



Safety Instructions

- When two or more active intrinsically safe circuits are connected to the indicator, in order to prevent voltage and/or current addition, applicable to the external circuits, precautions must be taken to separate the intrinsically safe circuits in accordance with IEC 60079-11.
- For the combined connection of the different supply, input and output circuits, the instructions in this manual must be observed.
- From the safety point of view the circuits shall be considered to be connected to earth.
- For installation under ATEX directive: this intrinsically safe device must be installed in accordance with the Atex directive 94/9/EC and the product certificate KEMA 03ATEX1074 X.
- For installation under IECEx scheme: this intrinsically safe device must be installed in accordance the product certificate IECEx DEK 11.0042X.
- Exchange of Intrinsically Safe battery FWLiBAT-0xx with certificate number KEMA 03ATEX1071 U or IECEx KEM 08.0005U is allowed in Hazardous Area. See paragraph 5.4. for detailed battery replacement instructions.



Note !

Please Note

- Certificates, safety values and declaration of compliance can be found in the document named: "Fluidwell F1...-XI - Documentation for Intrinsic Safety".
- Special conditions for safe use mentioned in both the certificate and the installation instructions must be observed for the connection of power to both input and / or output circuits.
- When installing this device in hazardous areas, the wiring and installation must comply with the appropriate installation standards for your industry.
- Study the following pages with wiring diagrams per classification.

Label information (inside and outside the enclosure)

Indicated labels on the back cover (below) and on the inside cover (right) show the type labels for intrinsically safe certified units.

For details on usage see the separate “Fluidwell F1...-XI Documentation for Intrinsic Safety”.

YEAR	WEEK	NUMBER
03	24	167
SERIALNR		
93	SERIALNR	

Serial number and year of production

This information can be looked-up on the display:
See setup function (par. 3.2.2.) for details.

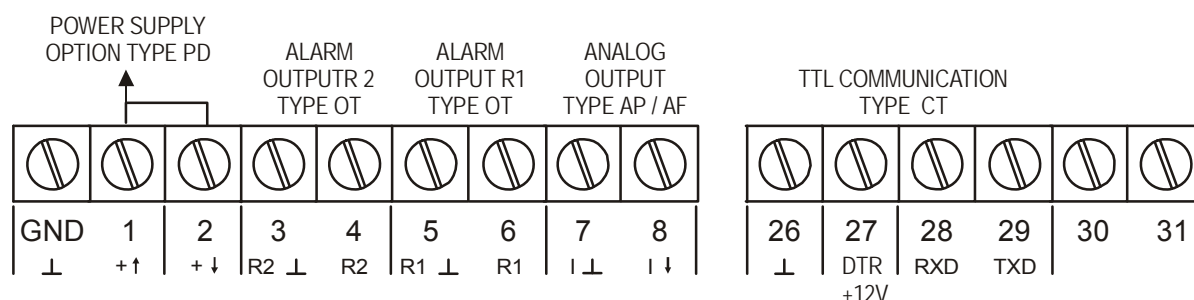
5.2. TERMINAL CONNECTORS INTRINSICALLY SAFE APPLICATIONS

Note !

The unit is classified as group IIB/IIIC by default.

Classification of the unit as group IIC is only possible under the following conditions:

- The indicator is either supplied by
 - the internal supply (option -PC); or
 - the external supply connected to terminals 0 and 1 (option -PD); or
 - the circuit supply connected to terminals 7 and 8 (option -AP);
 The maximum values for any of those circuits are those as defined for group IIB/IIIC;
- No other active external intrinsically safe circuits may be connected to the indicator, with exception of circuits connected to terminals 3 and 4 and/or terminals 5 and 6; the maximum values for any of those circuits are those as defined for group IIB/IIIC

Terminal connectors F193-X-XI:

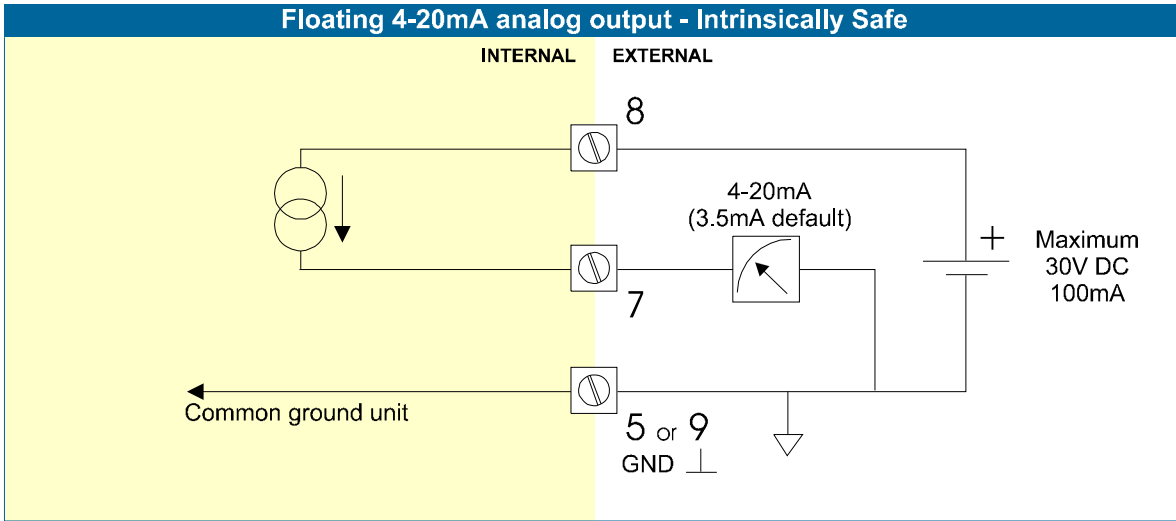
Explanation Intrinsically Safe options:

Type AF - Intrinsically Safe floating 4-20mA analog output:

A floating 4-20mA signal with this option.

When the output is disabled, a 3.5mA signal will be generated.

Max. driving capacity 1000 Ohm @ 30V DC.



Type PD - Intrinsically Safe power supply and sensor supply - Terminal GND- 01 and 11.

TYPE	SENSOR SUPPLY	Terminal			
		GND	01	02	
PD	Input voltage: 8-30V DC	Not Available	L-	L+	output voltage is according the input voltage; internally linked with terminal 01.

Terminal 02: this terminal offers the same voltage as connected to terminal 01.

5.3. CONFIGURATION EXAMPLES INTRINSICALLY SAFE APPLICATIONS

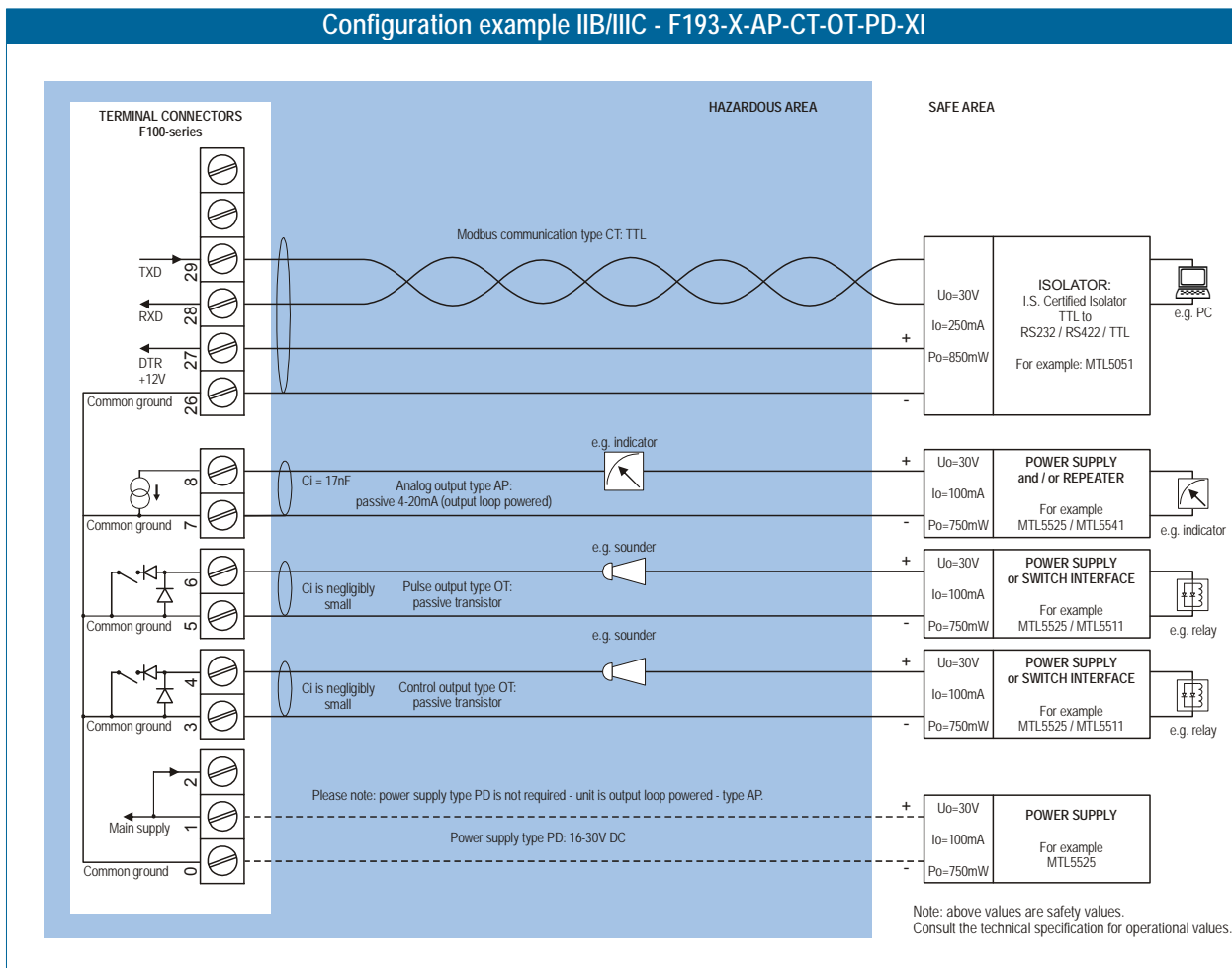


Fig. 12: Configuration example 1 Intrinsically Safe installation.

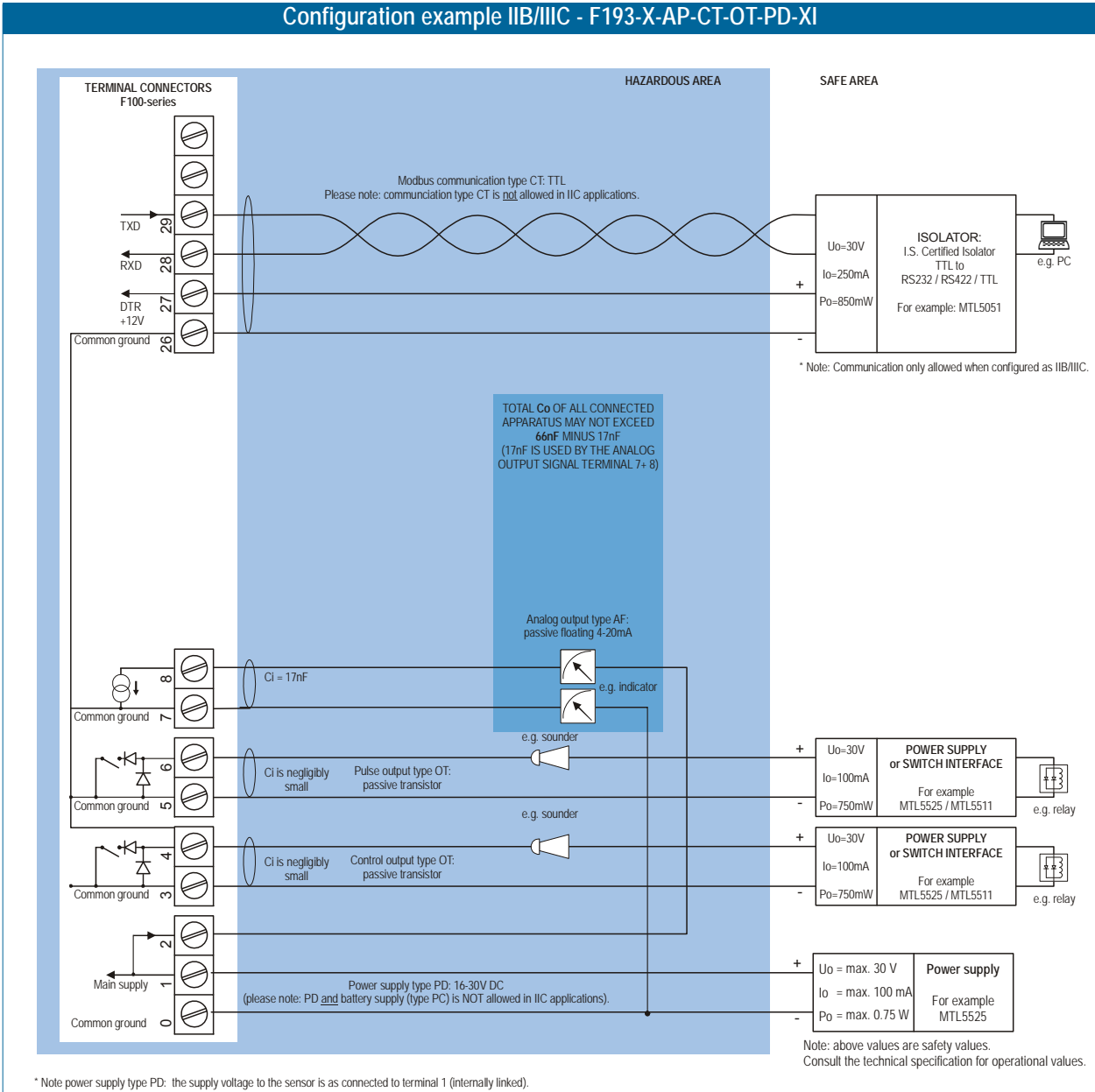


Fig. 13: Configuration example 2 Intrinsically Safe installation.

5.4 BATTERY REPLACEMENT INSTRUCTIONS



Safety Instructions

- **Fire, explosion or severe burns may result if mistreated.** Do not recharge, crush, disassemble, incinerate, heat above 100°C (212°F) or expose contents to water.
- Mounting, electrical installation, start-up and maintenance of this device may only be carried out by trained personnel authorized by the plant operator. Personnel must read and understand this instruction before carrying out the replacement procedure.
- Always follow the instructions listed in the supplied Battery Replacement Instruction Sheet.
- Batteries pose an environmental hazard. Return used batteries to a recycling point.



Caution !

Safety instructions for hazardous areas

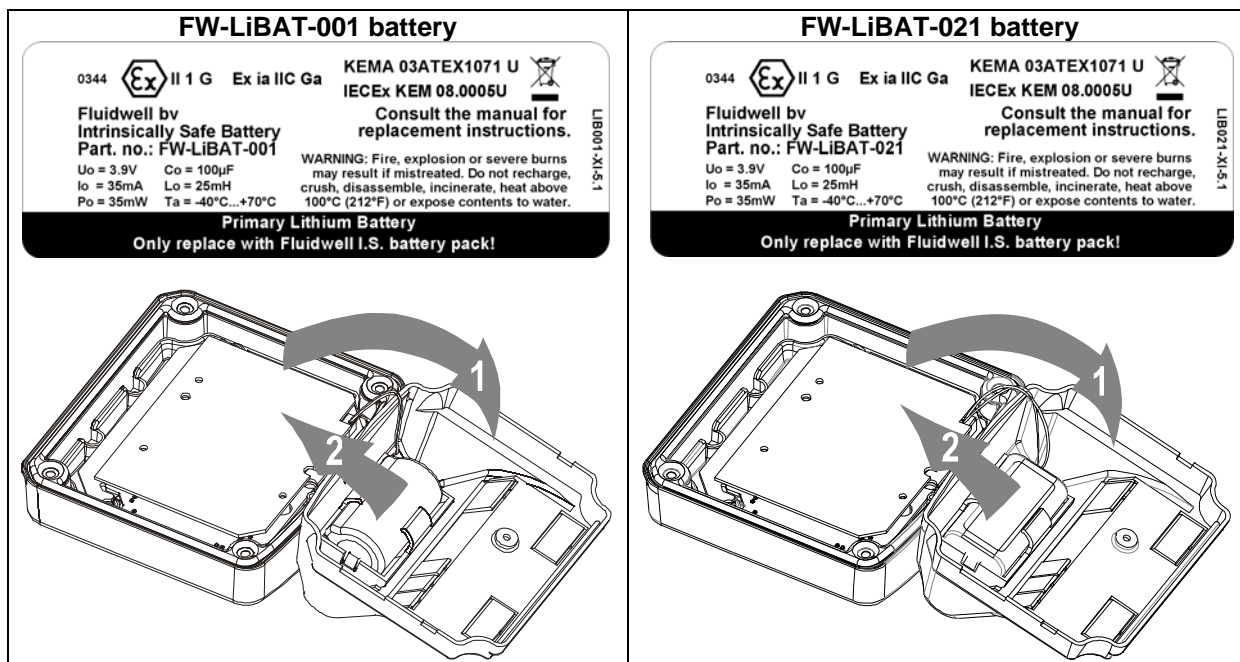
- Verify the correct battery is supplied: **Only batteries with indicated Ex label are certified for replacement and use in hazardous areas.** Batteries for use in safe areas have no Ex label. **DO NOT EXCHANGE:** Using the wrong type of battery can pose a SERIOUS RISK.
- **For use in hazardous areas Fluidwell recommends FW-LiBAT batteries (manufactured by Fluidwell bv) only.**

Battery replacement procedure



Note !

Depending on the production batch, one of two visualized Intrinsically Safe certified battery types may have been installed in the unit. They are interchangeable.



1. To replace the battery, open the unit to gain access to the back inside cover of the unit.
2. Unplug the field connectors from the back inside of the unit.
3. Remove the screw that holds the plastic inside cover.
4. Open the cover and unplug the battery connector.
5. Remove the battery from the inside of the plastic cover. *Do not remove the battery clip!*
6. Install the new battery and re-assemble the unit in reverse order.
7. Start-up the unit

6. MAINTENANCE

6.1. GENERAL DIRECTIONS



- *Mounting, electrical installation, start-up and maintenance of the instrument may only be carried out by trained personnel authorized by the operator of the facility. Personnel must read and understand this Operating Manual before carrying out its instructions.*
- *The F193-X may only be operated by personnel who are authorized and trained by the operator of the facility. All instructions in this manual are to be observed.*
- *Ensure that the measuring system is correctly wired up according to the wiring diagrams. Protection against accidental contact is no longer assured when the housing cover is removed or the panel cabinet has been opened (danger from electrical shock). The housing may only be opened by trained personnel.*
- *Take careful notice of the " Safety rules, instructions and precautionary measures " in the front of this manual.*

The F193-X does not require special maintenance unless it is used in low-temperature applications or surroundings with high humidity (above 90% annual mean). It is customers responsibility to take all precautions to dehumidify the internal atmosphere of the F193-X in such a way that no condensation will occur, for example by placing dry silica-gel in the casing just before closing the enclosure.

Furthermore, is required to replace or dry the silica gel from time to time as advised by the silica gel supplier.

Battery life-time:

It is influenced by several issues as:

- Analog output signal; be sure that an external power supply is connected or that the function is disabled if not in use; else it has major influence on the battery life-time (SETUP 91).
- Display update: fast display update has major influence; SETUP 81.
- Communication.
- Low temperatures; the available power will be less due to battery chemistry.



Note: *It is strongly advised to disable unused functions.*

Check periodically:

- The condition of the casing, cable glands and front panel.
- The input/output wiring for reliability and aging symptoms.
- The indication for low-battery.
- Clean the casing with soapy-water; don't use any aggressive solvents as these might damage the coating.

APPENDIX A: TECHNICAL SPECIFICATION

GENERAL

Display	
Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Digits	Seven 17mm (0.67") and eleven 8mm (0.31"). Various symbols and measuring units.
Refresh rate	User definable: 8 times/sec _ 30 secs.
Option ZB	Transflective LCD with green LED backlight. Good readings in full sunlight and darkness. Note: only available for safe area applications. Power requirements: 12-24V DC + 10% or type PD , PF , PM . Power consumption max. 1 Watt.
Enclosures	
General	Die-cast aluminum or GRP (Glassfibre Reinforced Polyamide) enclosure with Polycarbonate window, silicone and EPDM gaskets. UV stabilized and flame retardant material.
Control Keys	Three industrial micro-switch keys. UV-stabilized silicone keypad.
Painting	Aluminum enclosure only: UV-resistant 2-component industrial painting.
Panel-mount enclosures	Dimensions: 130 x 120 x 60mm (5.10" x 4.72" x 2.38") – LxHxD.
Classification	IP65 / NEMA4
Panel cut-out	115 x 98mm (4.53" x 3.86") LxH.
Type HC	GRP panel-mount enclosure
Type HB	Aluminum panel-mount enclosure
Field/wall-mount enclosures	Dimensions: 130 x 120 x 75mm (5.10" x 4.72" x 2.95") – LxHxD.
Classification	IP67 / NEMA4X
Aluminum enclosures	
Type HA	Drilling: 2x PG9 – 1x M20.
Type HM	Drilling: 2x M16 – 1x M20.
Type HN	Drilling: 1x M20.
Type HO	Drilling: 2x M20.
Type HP	Drilling: 6x M12.
Type HT	Drilling: 1x ½"NPT.
Type HU	Drilling: 3x ½"NPT.
Type HZ	No drilling.
GRP enclosures	
Type HD	No drilling.
Type HE	Drilling: 2x 16mm (0.63") – 1x 20mm (0.78").
Type HF	Drilling: 1x 22mm (0.87").
Type HG	Drilling: 2x 20mm (0.78").
Type HH	Drilling: 6x 12mm (0.47").
Option ZS	Silicone free ABS enclosure with EPDM and PE gaskets. UV-resistant polyester keypad. Note: this option comes with type HD only.
Operating temperature	
Operational	-30°C to +80°C (-22°F to +178°F).
Intrinsically Safe	-30°C to +70°C (-22°F to +158°F).
Power supply	
Type PB	Lithium battery - life-time depends upon settings - up to 5 years.
Type PC	Intrinsically Safe lithium battery - life-time depends upon settings - up to 5 years.
Type PD	8-24V AC / DC ± 10%. Power consumption max. 10 Watt. Intrinsically safe: 16-30V DC; power consumption max. 0.75 Watt.
Type PF	24V AC / DC ± 10%. Power consumption max. 15 Watt.
Type PL	Not available.
Type PM	115-230V AC ± 10%. Power consumption max. 15 Watt.
Type PX	Output loop powered: 8-30V DC. Power consumption max. 0.5 Watt.
Note PF / PM	The total consumption of the backlight and outputs may not exceed 400mA@24V.
Note I.S. applications	For intrinsically safe applications, consult the safety values in the certificate.
Terminal connections	
Type:	Removable plug-in terminal strip. Wire max. 1.5mm ² and 2.5mm ² (type PM / PF)
Data protection	
Type	EEPROM backup of all setting. Data retention at least 10 years.
Pass code	Configuration settings can be pass code protected.

Hazardous area (option)	
Intrinsically safe Type XI	ATEX approval ref: <EX> II 1 GD EEx ia IIB/IIC T4 – T100°C.
Explosion proof Type XD/XF	ATEX approval ref.: <EX> II 2 GD EEx d IIB T5. Weight appr. 15kg. Dimensions of enclosure: 350 x 250 x 200mm (13.7" x 9.9" x 7.9") LxHxD.
Environment	
Electromagnetic compatibility	Compliant ref: EN 61326 (1997), EN 61010-1 (1993).

OUTPUTS

Analog output	
Function	transmitting a value set through communication.
Accuracy	10 bit. Error < 0.05% - update 10 times a second. Software function to calibrate the 4.00mA and 20.00mA levels precisely within set-up.
Load	max. 1 kOhm
Type AA	Active 4-20mA output (requires type OA + PD, PF or PM).
Type AB	Active 0-20mA output (requires type OA + PD, PF or PM).
Type AF	Passive floating 4-20mA output for Intrinsically Safe applications (requires PC, PD or PL).
Type AI	Passive galvanically isolated output (requires PB, PD, PF, PL or PM).
Type AP	Passive 4-20mA output - output loop powered (type PX).
Type AU	Active 0-10V output (requires type OA + PD, PF or PM).

Switch output(s)	
Function	transmitting an alarm condition or to control a device through communication.
Type OA	Three active 24V DC outputs; max. 50mA per output (requires type AA + PD, PF or PM).
Type OR	Two electro-mechanical relay output; max. switch power 230V AC - 0,5A and one OT or OA output. (requires type PF or PM).
Type OS	Four electro-mechanical relay output; max. switch power 230V AC - 0,5A (requires type PD and AP).
Type OT	two (intrinsically safe) or three passive transistor outputs - not isolated. Load max 50V - 300mA.

Communication	
Functions	writing display information, controlling the analog and switch outputs, reading / writing all settings.
Protocol	Modbus ASCII or RTU
Speed	1200 - 2400 - 4800 - 9600 baud
Addressing	maximum 255 addresses.
Type CB	RS232
Type CH	RS485 2-wire
Type CI	RS485 4-wire
Type CT	TTL Intrinsically Safe communication.
Type CX	no communication.

OPERATIONAL

Operator functions	
	<ul style="list-style-type: none"> actual product value with measuring unit product number alarm condition selection of all products through the keyboard initialization of the alarm condition
Value	
Digits	7 digits.
Units	L, m3, GAL, USGAL, KG, lb, bbl, no unit.
Decimals	0 - 1 - 2 or 3.

APPENDIX B: PROBLEM SOLVING

In this appendix, several problems are included that can occur when the F193-X is going to be installed or while it is in operation.

Analog output does not function properly:

Check:

- SETUP 91 - is the function enabled?
- SETUP 92 / 93: are the flow-levels programmed correctly?
- connection of the external power-supply according specification.

The password is unknown:

If the password is not 1234, there is only one possibility left: call your supplier.

ALARM

When the alarm flag starts to blink an internal alarm condition has occurred. Press the "select button" several times to display the 5-digit error code. The codes are:

0001: irrecoverable display-data error: data on the display might be corrupted.

0002: irrecoverable data-storage error: the programming cycle might have gone wrong: check programmed values.

0003: error 1 and error 2 occurred simultaneously

The alarm condition will almost certainly be handled internally and if all mentioned values still appear correct, no intervention by the operator is needed. If the alarm occurs more often or stays active for a longer time, please contact your supplier.

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NOTES

Left blank intentionally.

LIST OF CONFIGURATION SETTINGS			
SETTING	DEFAULT	DATE :	DATE :
1 - CONFIGURATION			
11 products	1		
12 display	product		
13 scroll	enable		
14 toggle	disable		
15 alarm output	auto-off		
16 clearing	enable		
2 - UNITS			
21 unit (product 1)	L		
22 unit (product 2)	L		
23 unit (product 3)	L		
24 unit (product 4)	L		
25 unit (product 5)	L		
26 unit (product 6)	L		
27 unit (product 7)	L		
28 unit (product 8)	L		
29 unit (product 9)	L		
3 - UNITS			
31 decimals (product 1)	L		
32 decimals (product 2)	L		
33 decimals (product 3)	L		
34 decimals (product 4)	L		
35 decimals (product 5)	L		
36 decimals (product 6)	L		
37 decimals (product 7)	L		
38 decimals (product 8)	L		
39 decimals (product 9)	L		
4 - OUTPUT ALARM			
41 output (product 1)	none		
42 output (product 2)	none		
43 output (product 3)	none		
44 output (product 4)	none		
45 output (product 5)	none		
46 output (product 6)	none		
47 output (product 7)	none		
48 output (product 8)	none		
49 output (product 9)	none		
5 - VALUE DISPLAYED			
51 value (product 1)	0		
52 value (product 2)	0		
53 value (product 3)	0		
54 value (product 4)	0		
55 value (product 5)	0		
56 value (product 6)	0		
57 value (product 7)	0		
58 value (product 8)	0		
59 value (product 9)	0		

SETTING	DEFAULT	DATE :	DATE :
6 - ALARM			
61 alarm set (product 1)	off		
62 alarm set (product 2)	off		
63 alarm set (product 3)	off		
64 alarm set (product 4)	off		
65 alarm set (product 5)	off		
66 alarm set (product 6)	off		
67 alarm set (product 7)	off		
68 alarm set (product 8)	off		
69 alarm set (product 9)	off		
7 - RELAY OUTPUT			
71 relay 1	off		
72 relay 2	off		
73 relay 3	off		
74 relay 4	off		
8 - POWER MANAGEMENT			
81 LCD-new	1 sec.		
82 mode	operational		
9 - ANALOG OUTPUT			
91 output	disabled		
92 min. value (0)4mA / 0V	0000000		
93 max. value 20mA / 10V	9999999		
94 set value	0		
95 tune min value (0)4mA / 0V	0208		
96 tune max value 20mA / 10V	6656		
97 filter	01 (off)		
A - COMMUNICATION			
A1 baud-rate	2400		
A2 address	1		
A3 mode	BUS-RTU		
A4 time out	10.0 sec		
B - OTHERS			
B1 model	F193-X		
B2 software version	02.05.xx		
B3 serial number	xxxxxxx		
B4 password	0000		
B5 tagnumber	0000000		

