



50 YEARS
1967-2019

Q ISO 9001
Certified Quality

5 YEARS
Extended Warranty

CE EN-61010-1
Security

CE EN-61326-1
Electromagnetic C.

Weight

4. CONNECTIONS

- For power connections see image below.
- For input signal connections see image below and 'Table 1' and section 10.
- For output signal module connections see image below and 'Table 2' and Table 3.

To identify the power and/or modules installed, check the reference at the instruments label and see section 5

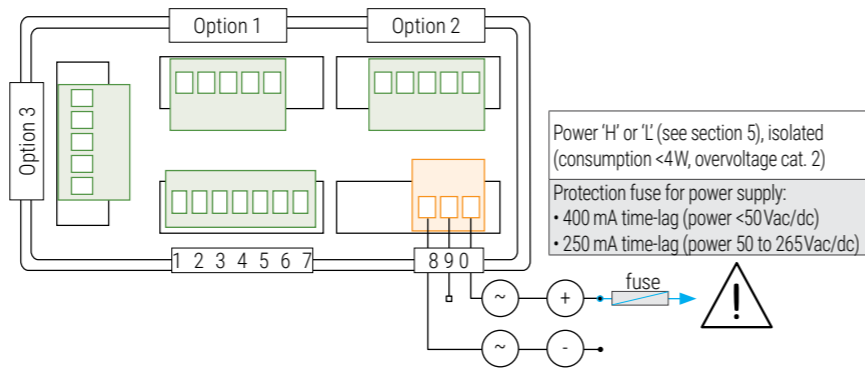


Table 1 | INPUT signal connections

Terminal	Label	Description
7	EK	'on/off' rear control (short circuit to 'Vexc-')
6	Vexc+	Excitation voltage +
5	Sense+	*Excitation voltage sense +
4	Signal+	Signal +
3	Signal-	Signal -
2	Sense-	*Excitation voltage sense -
1	Vexc-	Excitation voltage -

*If 'sense' is not used, shortcircuit 'Sense+' with 'Vexc+' and 'Sense-' with 'Vexc-'.

When connecting the ground to the cell system, assure that the cell connection to ground is performed in such a way that the current to ground DOES NOT flow through the cell.

5. REFERENCE

Model	Power	Option 1	Option 2	Option 3	Others	Customization
M60-LC	H					
(K40-LC)	-H (85-265 Vac/dc)	-R1 (1 relay)	-AO (analog output)	-RTU (Modbus RTU)	-S4 (RS-485)	-NBT (no keypad)
(S40-LC)	-L (11-60 Vdc)	-S2 (RS-232)	-T1 (1 transistor)	-SSR (1 control SSR)	-G (green led)	.XXXX (custom execution)
		-	-	-		

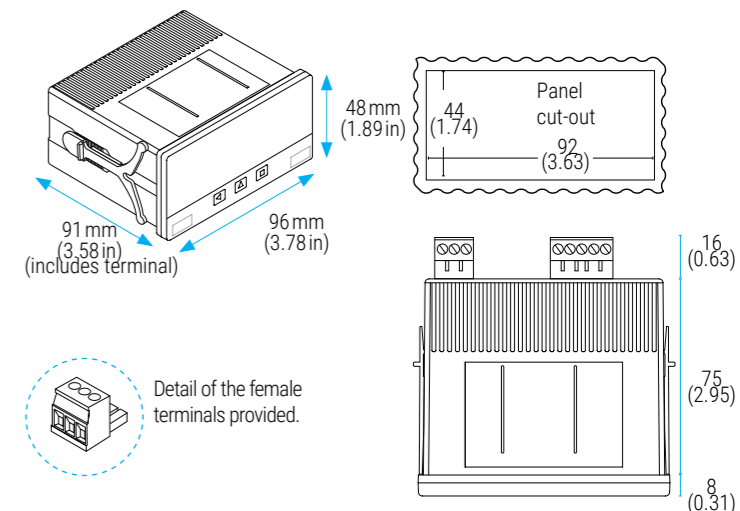
Table 2 | OUTPUT connections 1

OUTPUT signal	Output terminal			Terminal rear view
	A	B	C	
R1	comm.	NO	NC	A B C
T1	Emitter	Collector	---	A B C
SSR	---	Current in	Vexc +15V	A B C
AO	Vexc.	Signal out (mA or Vdc)	common	MV A B C
RTU	'B'	'A'	GND	A B C
S4	'B'	'A'	GND	A B C

Table 3 | OUTPUT connections 2

OUTPUT signal	Output terminal						Terminal rear view
	A G M	B H N	C I O	D J P	E K Q	F L R	
S2	Tx2	Rx2	Tx1	Rx1	GND		A B C D E
R2	comm.1	NO1	NC1	comm.2	NO2	NC2	A B C D E F
R4	comm.1	NO1	NC1	comm.2	NO2	NC2	A B C D E F
	comm.3	NO3	NC3	comm.4	NO4	NC4	G H I J K L
R6	comm.1	NO1	NC1	comm.2	NO2	NC2	A B C D E F
	comm.3	NO3	NC3	comm.4	NO4	NC4	G H I J K L
	comm.5	NO5	NC5	comm.6	NO6	NC6	M N O P Q R

6. DIMENSIONS & PANEL CUT-OUT 'mm' (in)

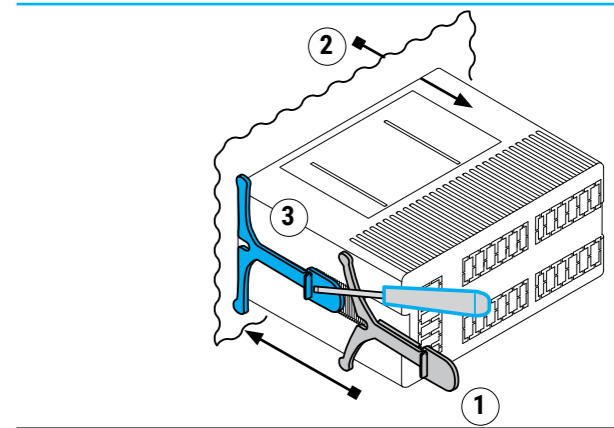


7. HOW TO PANEL THE INSTRUMENT

How to install the meter in a panel (see Table 4)

1. Remove the blue fixation clips from each side of the unit.
2. Insert instrument from the front of the panel into panel cut out.
3. Re-attached the two blue fixation tabs by sliding each one along its rail on each side and push until the tabs are tight onto the panel. If needed use a flat screwdriver to push the tabs strongly to the end.

Table 4 | PANEL INSTALLATION 1-2-3



8. HOW TO OPEN THE INSTRUMENT

Use a flat screwdriver to unlock clips 'D', 'C', 'B' and 'A', in this order. Remove the front filter. Gently let the internal boards slide out of the instrument.

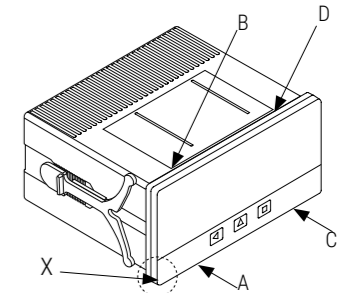
To reinsert the boards in the housing :

1. make sure that the boards are correctly connected to the displays pins
2. slide the boards into the housing guides
3. place the front filter at corner X, and then insert clips 'A', 'B', 'C' and 'D' in this order.

⚡ Risk of electric shock. Removing the front cover will grant access to internal circuits which may be at dangerous voltage. Disconnect the input signal and the power supply to prevent electric shock to the operator. Operation must be performed by qualified personnel only.

⚡ Observe precautions for handling ESD (electrostatic discharge) sensitive devices.

Table 5 | HOW TO OPEN THE HOUSING



1. INSTALLATION AND START-UP

• For specifics on K40-LC and S40-LC see sections 16 and 20.

1. Install the instrument at the panel (see section 6)
2. Connect the power supply (see section 4)
3. Connect the input signal (see section 4)
4. See section 12 on how to access the 'configuration menu' and go to the 'Initial configuration' parameters (see section 15). See section 9 for a detailed explanation on the initial configuration.
 - at 'CELL' menu, configure the sensitivity, load and excitation
 - apply the empirical configuration of the cell (apply the high and low 'field correction')
 - assign the 'system zero'
5. At the 'advanced configuration' section, configure:
 - the automatic tare (optional)
 - a scale factor to apply to the reading (optional)
 - the acquisition modes for maximum rejection to 50 or 60 Hz noise signals (optional)
6. Configure the alarms (optional) and the display filters (optional)
7. Configure operator controls (optional)
 - configure the function assigned to the rear control
 - configure the function assigned to the front key 'LE' (◀)
 - configure the parameters accessible at the fast access (front key 'UP' (▲))
8. Configure other functions (optional)
 - configure the 'on power up' function
 - configure the password and brightness level
9. If output options are installed
 - connect the output options (see section 4)
 - configure the output options

For a full explanation on how to configure the instrument, access the user's manual (see section 3). Do not forget to read the 'installation precautions' section at the user's manual.

2. MATERIAL INCLUDED

- The instrument is provided with the following elements :
- 1 x Instrument M60-LC with requested power and options installed (see section 5)
 - Plug-in screw terminals, connected to the instrument, or in separate bags
 - 1 x Set of units label
 - 1 x Quick installation guide

3. ADDITIONAL DOCUMENTATION

User's manual M60-LC	www.fema.es/docs/4507_M60-LC_manual_en.pdf
Datasheet M60-LC	www.fema.es/docs/4509_M60-LC_datasheet_en.pdf
Declarations of conformity	www.fema.es/docs/5644_CE-Declaration_M_en.pdf www.fema.es/docs/5650_UKCA-Declaration_M_en.pdf
CE Declaration of conformity	www.fema.es/docs/4507_M60-LC_manual_en.pdf
Warranty	www.fema.es/docs/4153_Warranty1_en.pdf
Web	www.fema.es/Series_M



Scan the QR code to directly access the user's manual of this instrument.

9. INITIAL CONFIGURATION

Identify the parameters of the load cell, at the manufacturer's datasheet and fill Table 6 below. If the parameters are not known, leave the instrument with the default values. The 'initial configuration' procedure has a first theoretical step and a second empirical step. The third and final step will set the 'system zero' of the instrument. After the third step is applied and the instrument is correctly reading the load cell, the rest of the parameters can be configured, and there is no need to reconfigure the 'initial configuration' parameters.

Table 6 | LOAD CELL THEORETICAL PARAMETERS

Parameter	Default values	My load cell values
Sensitivity	2 mV/V	
Nominal weight	1000 Kilos	
Excitation voltage	10 Vdc	

1. Theoretical characterization of the load cell

Access the 'configuration menu', and enter the 'initial configuration' (InIt) menu. The theoretical parameters are configured at the 'Load cell parameters' (cELL) menu.

- at 'Decimal point' (dP) place the decimal point according to the resolution you want to see (the number of digits to the right of the decimal point)
- at 'Nominal weight' (LoAd) introduce the nominal weight of the load cell. The value is entered with the resolution configured in the parameter above.
- at 'Sensitivity' (MV.V) introduce the value of the cell sensitivity.
- at 'Excitation voltage' (V.EXc) select 5 or 10 Vdc. (The 'Laboratory mode' (LAb) is for direct connection to a millivolt generator instead of a load cell (see Table 11)).

When the theoretical values are configured, leave the configuration menu, then apply a 'system zero' (see below), then force a tare, and place different weights to check if the reading is correct. If it is not correct, apply the empirical configuration (see below) and again the 'system zero' (see below).

2. Empirical characterization of the load cell

The second part of the load cell configuration is an empirical process of field correction. The instrument will detect and correct the individual deviations of this particular load cell.

For the empirical configuration you will need access to two weights: a low weight, as small as possible (it can be the cell without weight) and a high weight as close as possible to the nominal weight of the cell.

In each case the meter will be informed of the real weight applied to the cell in order to correct and compensate for the measured deviations at the signal. Both corrections are needed (high and low) for a correct configuration of the load cell.

- low weight correction: place the load cell without weight or with the smallest weight possible, and access the 'Low weight correction' (F.Lo) menu. Press key 'SQ' (■), introduce the value of the weight and press again 'SQ' (■). The instrument will flash shortly and return to the menu entry 'Low weight correction' (F.Lo).

- high weight correction: place the load cell with a weight closest to nominal and access the 'High weight correction' (F.hI) menu. Press key 'SQ' (■), introduce the value of the weight and press again 'SQ' (■). The instrument will flash shortly and return to the menu entry 'High weight correction' (F.hI).

Once both corrections are applied, leave the configuration menu. Force a tare, and place different weights to check that the reading is correct. As a last step, assign the 'system zero'.

3. Assign the 'system zero'

This is a necessary and important step for a correct measurement with a load cell.

- place the load cell without weight or with the weight that will be considered as 'zero' and access the 'System zero' (S.ZEr) parameter. Press key 'SQ' (■). The instrument will flash shortly and return to the menu entry 'System zero' (S.ZEr).

The empirical configuration of the load cell recalculates and updates the theoretical sensitivity value ('Sensitivity mV/V' (MV.V) parameter). Manual modifications of this parameter will modify the configuration of the cell. To prevent accidental modification consider the activation of the 'password' function.

Once the load cell has been correctly configured, and the reading of the instrument is correct, it is not necessary to access again this part of the configuration menu. If you need to scale the reading to different units, use the 'Scale factor' (ScL.F) parameters at the 'Advanced configuration' menu.

The 'Scale factor' (ScL.F) configures a fixed multiplier to apply to the reading. For example, a system is configured to read in Kg, and we want reading in pounds. The relation between kilograms and pounds is: 1 Kg=2,20462 pounds. Within the scale factor, configure the multiplier to 220462 and the divider to 100000. The instrument is now configured to read in 'pounds'.

10. ADDITIONAL CONNECTION EXAMPLES

Table 7 | LOAD CELL WITH EXTERNAL POWER

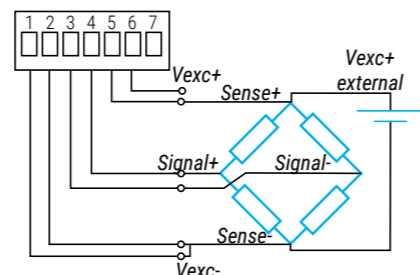


Table 8 | LOAD CELL WITH JUNCTION BOX

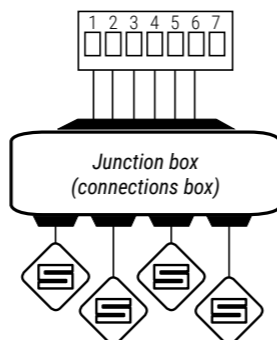


Table 9 | THREE LOAD CELLS

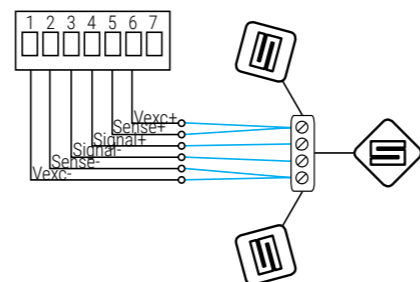


Table 10 | FOUR LOAD CELLS

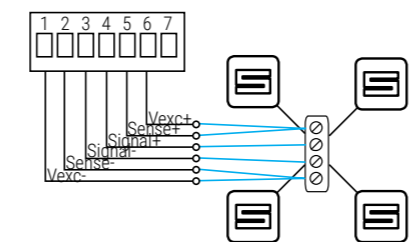
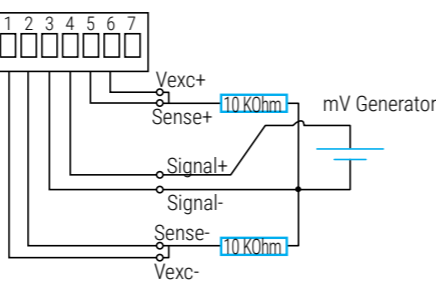


Table 11 | LABORATORY mV GENERATOR



11. FRONT VIEW

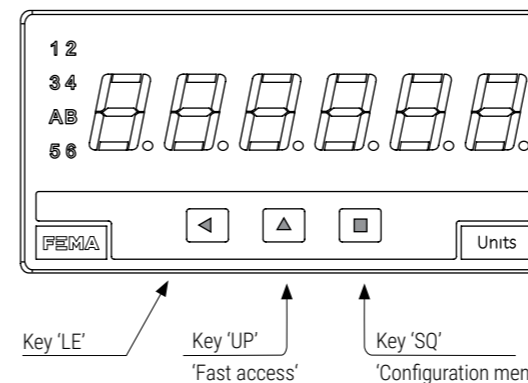


Table 12 | LEDES 'A' AND 'B'

READING	A	B
Gross weight	on	off
Actual tare value	off	on
'Tare' function activated	off	fast flash
Net weight	off	off
Units ('stock units')	on	on

12. HOW TO OPERATE

AT POWER-UP When the power supply is connected:

- the 'display' shows '.....' and then indicates the reading.
- the instrument is now in 'normal mode' of operation.

FROM 'NORMAL MODE' OF OPERATION

- key 'SQ' (■) gives access to the 'configuration menu' (see section 15).
- key 'UP' (▲) gives access to the 'fast access' menu
- key 'LE' (◀) activates the 'key left' functions.

HOW TO ENTER THE 'CONFIGURATION MENU'

With the instrument in 'normal mode' of operation, press the 'SQ' (■) key and maintain for 1 second.

The first menu entry displayed is 'Initial conf.' (InIt). Download the user's manual (see section 3) for a full explanation on the functions available.

HOW TO OPERATE INSIDE THE 'CONFIGURATION MENU'

Inside the 'configuration menu', use the front keypad to move through menu entries, parameters, and select configuration values:

- Key 'SQ' (■)** functions as the 'ENTER' key. It selects the menu entry currently displayed. At numerical value entries, it validates the number displayed.
- Key 'UP' (▲)** moves vertically through the different menu entries. At numerical value entries, it modifies the selected digit by increasing its value to 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.
- Key 'LE' (◀)** functions as the 'ESCAPE' key. It leaves the selected menu entry, and eventually, will leave the 'configuration menu'. When leaving the 'configuration menu', the changed parameters are activated. At numerical value entries, the 'LE' (◀) key allows to select the active digit. To modify a numeric value press the 'UP' (▲) key to increase the value '+1'. Press the 'SQ' (■) key to validate the value.

'ROLLBACK' FUNCTION

If there is no interaction from the operator for 30 seconds, the instrument exits the 'configuration menu' discarding changes, and returns to 'normal mode' of operation.

WHEN EXITING THE 'CONFIGURATION MENU'

When exiting the 'configuration menu', a start-up is applied. After start-up, the new configuration is active and the instrument is in 'normal mode' of operation.

13. ERROR CODES

Table 13 | Error codes

'd.ovr'	Display overrange. The display should be higher than the maximum available value (999999).
'd.udr'	Display underrange. The display should be lower than the minimum available value (-199999).
'Err.0'	Incorrect scaling. Vertical slope.
'Err.1'	Password error. The password code entered is not correct.
'Err.2'	The installed menu option is not recognized.
'Err.8'	Excitation voltage overload.
'...'	Requested reading is not accessible (reading of units with the 'stock units' mode disabled)..
'999999'	Flashing mode. Reading is in overrange.
'-199999'	Flashing mode. Reading is in underrange.

14. REGULATIONS

This instrument conforms to the actual CE regulations. For a copy of the 'CE declaration of conformity' see section 3. Applicable regulations are:

Security regulations EN-61010-1 ('Fixed' equipment, 'Permanently connected'. 'Double' isolation. Overvoltage category 2).

Electromagnetic compatibility regulations EN-61326-1

This instrument does not provide a general mains switch and will start operation as soon as power is connected. The instrument does not provide protection fuse, and the fuse must be added during installation. Instrument designed to be panel mounted.



Risk of electrical shock. Instrument terminals can be connected to dangerous voltage.



Instrument protected with double isolation. No earth connection required.



Instrument conforms to CE and UKCA rules and regulations.



According to directive 2012/19/EU, electronic equipment must be recycled in a selective and controlled way at the end of its useful life.



Standard warranty of 2 years according to actual european legislation. Free of cost warranty extension of 5 years, available at (see section 3).



Installation of this instrument must be performed by qualified personnel only. The user's manual contains the appropriate information for the installation. Using the instrument in ways not specified by the manufacturer may lead to a reduction of the specified protection level. Disconnect the instrument from power before starting any maintenance and/or installation action.

The instrument does not have a general switch and will start operation as soon as power is connected. The instrument does not have protection fuse, the fuse must be added during installation.

The instrument is designed to be panel mounted. An appropriate ventilation of the instrument must be assured. Do not expose the instrument to excess of humidity. Maintain clean by using a humid rag and do NOT use abrasive products such as alcohols, solvents, etc.

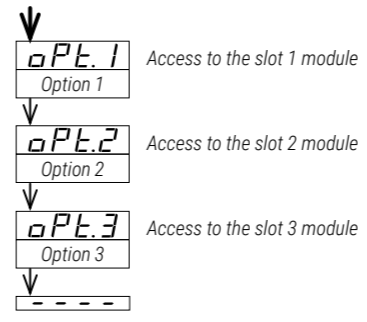
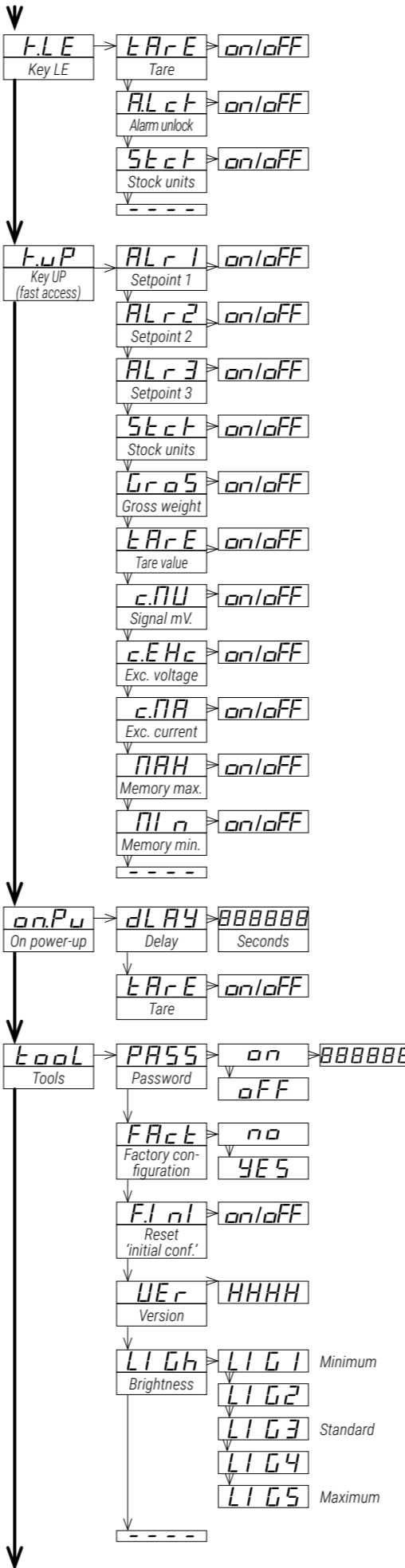
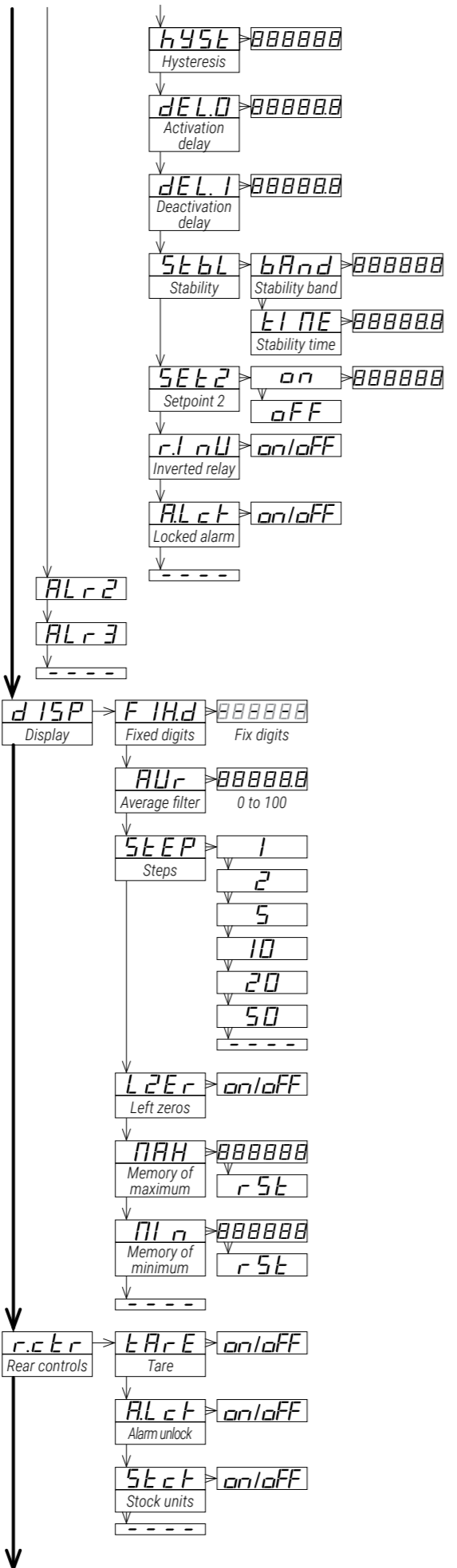
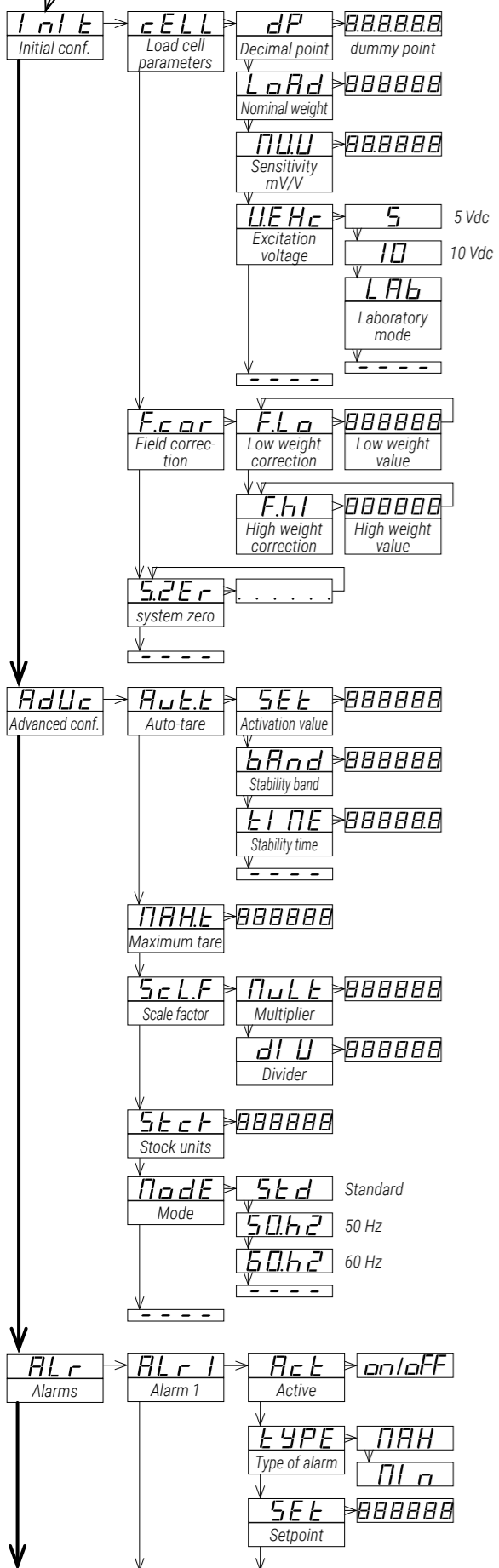
General recommendations for electrical installations apply, and for proper functionality we recommend: if possible, install the instrument far from electrical noise or magnetic field generators such as power relays, electrical motors, speed variators, ... If possible, do not install along the same conduits power cables (power, motor controllers, electrovalves, ...) together with signal and/or control cables.

Before proceeding to the power connection, verify that the voltage level available matches the power levels indicated in the label on the instrument.

In case of fire, disconnect the instrument from the power line, fire alarm according to local rules, disconnect the air conditioning, attack fire with carbonic snow, never with water.

15. CONFIGURATION MENU

Press 'SQ' (■) for 1 second



16. FACTORY CONFIGURATION

Initial configuration (Init)	
Load cell parameters (cELL)	
Decimal point (dP)	without (XXXXXX)
Sensitivity mV/C (MV.V)	2.0000
Nominal weight (LoAd)	200000
Excitation voltage (V.Exc)	10 Vdc ('10')
Advanced configuration (AdvC)	
Auto-tare (Aut.t)	
Activation value (SEt)	10
Stability band (bAnd)	0 (disabled)
Stability time (tIME)	0.0 (disabled)
Maximum tare (MAX.t)	999999
Scale factor (ScL.F)	
Multiplier (MuLt)	1
Divider (dIV)	1
Stock units (StcK)	0 (disabled)
Mode (ModE)	standard ('Std')
Alarms 1,2 and 3 (ALr.1, ALr.2, ALr.3)	
Active (Act)	off (disabled)
Type (tYPE)	maximum ('MAX')
Setpoint (SEt)	1000
Hysteresis (hYSt)	0 counts
Activation delay (dEL.0)	0.0 seconds
Deactivation delay (dEL.1)	0.0 seconds
Stability (StbL)	
Stability band (bAnd)	10 counts
Stability time (tIME)	0.0 (disabled)
Setpoint 2 (SEt.2)	off (disabled)
Inverted relay (r.lnV)	off
Locked alarms (A.LcK)	off
Display (dISP)	
Fixed digits (FIX.d)	no fixed digits ('-----')
Average filter (AVr)	0 (disabled)
Steps (StEP)	1
Left zeros (LzEr)	off
Memory of maximum (MAX)	-199999
Memory of minimum (MIn)	999999
Rear controls (r.cTr)	
all 'off'	
Key LE (K.LE)	
Tare	on
Alarm unlock	off
Stock units	off
Key UP (K.uP)	
all 'off'	
On power up	
Delay	0
Tare	off
Tools	
Password (PASS)	off
Reset 'initial conf.' (F.InI)	off
Brightness (LIgh)	3

RESET TO DEFAULT FACTORY PARAMETERS
 To return to default factory parameters, enter into 'configuration menu', go to 'Tools' (tool) / 'Factory reset' (FAct) and select 'yes'
 • the instrument applies a restart
 • the instrument is in 'normal mode' of operation
 The 'initial configuration' parameters are not reset by default. If you want to reset also the 'initial configuration', set parameter 'Reset initial conf' (F.InI) to 'yes' and apply a factory reset as indicated above.

17. SPECIFIC INFORMATION FOR K40-LC



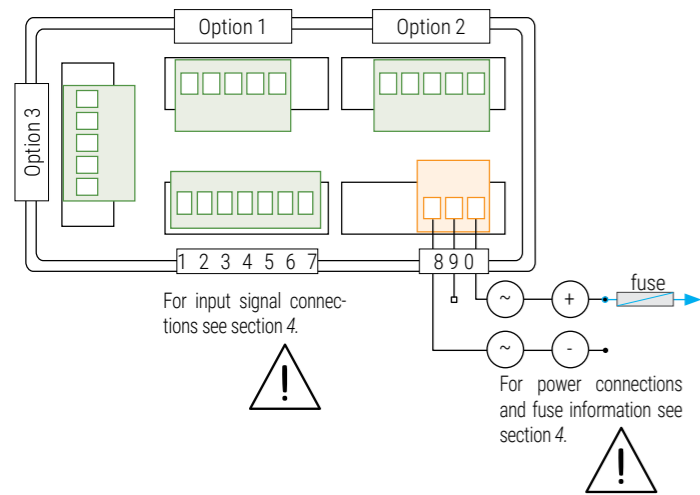
This 'Quick Installation Guide' is designed for reference M60-LC. References K40-LC and S40-LC are variations from the main reference M60-LC, where K40-LC is the version with larger digits and S40-LC is the version with smaller housing.

Differences that apply to K40-LC are listed below (see Table 14) . If not indicated, the standard information applies.

Table 14 | VARIATIONS ON DOCUMENTATION FOR K40-LC

PARAMETER	K40-LC	M60-LC
Number of digits	4	6
Housing sizes	Same	
Panel sizes	Same	
Rear connections	Same	
Slot for optional modules	Same	

23. K40-LC CONNECTIONS



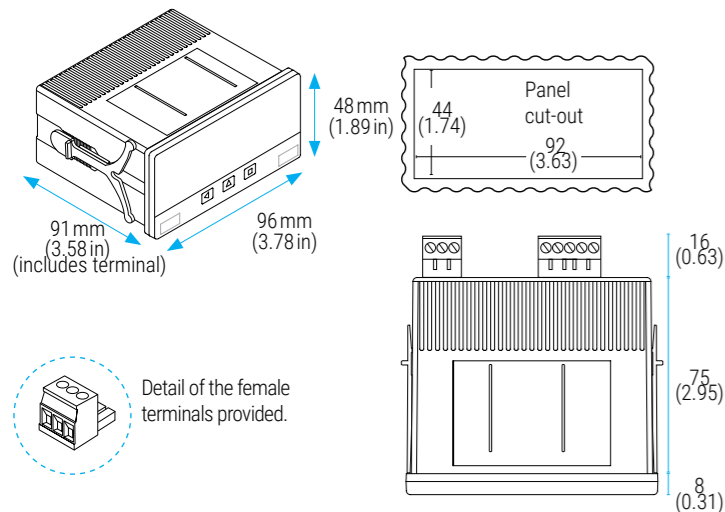
18. K40-LC DOCUMENTATION

User's manual K40-LC	www.fema.es/docs/4617_K40-LC_manual_en.pdf
Datasheet K40-LC	www.fema.es/docs/4619_K40-LC_datasheet_en.pdf
Quick installation guide K40-LC	www.fema.es/docs/5268_M60-LC_installation_en.pdf
Declarations of conformity	www.fema.es/docs/5645_CE-Declaration_K_en.pdf www.fema.es/docs/5651_UKCA-Declaration_K_en.pdf
Warranty	www.fema.es/docs/4153_Warranty1_en.pdf
Web	www.fema.es/Series_K

Scan the QR code to directly access the user's manual of this instrument.



19. K40-LC DIMENSIONS & PANEL CUT-OUT 'mm' (in)



20. SPECIFIC INFORMATION FOR S40-LC



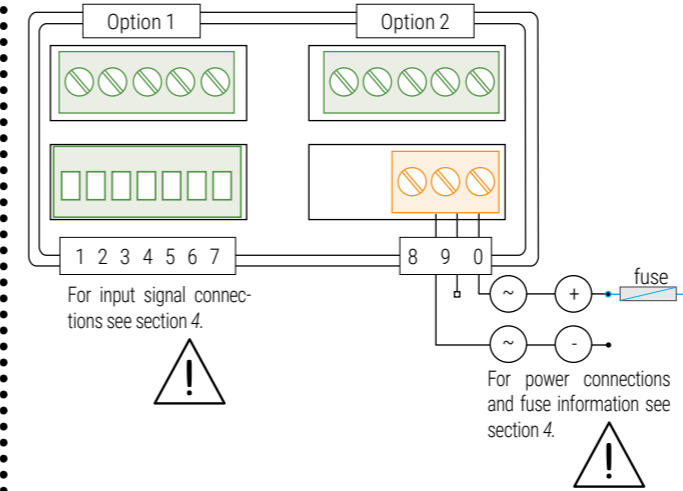
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Differences that apply to S40-LC are listed below (see Table 15) . If not indicated, the standard information applies.

Table 15 | VARIATIONS ON DOCUMENTATION FOR S40-LC

PARAMETER	S40-LC	M60-LC
Number of digits	4	6
Housing sizes	Smaller	Standard
Panel sizes	Smaller	Standard
Rear connections	Same	
Slot for optional modules	2	3

24. S40-LC CONNECTIONS



21. S40-LC DOCUMENTATION

User's manual S40-LC	www.fema.es/docs/4621_S40-LC_manual_en.pdf
Datasheet S40-LC	www.fema.es/docs/4623_S40-LC_datasheet_en.pdf
Quick installation guide S40-LC	www.fema.es/docs/5268_M60-LC_installation_en.pdf
Declarations of conformity	www.fema.es/docs/5646_CE-Declaration_S_en.pdf www.fema.es/docs/5652_UKCA-Declaration_S_en.pdf
Warranty	www.fema.es/docs/4153_Warranty1_en.pdf
Web	www.fema.es/Series_S

Scan the QR code to directly access the user's manual of this instrument.



22. S40-LC DIMENSIONS & PANEL CUT-OUT 'mm' (in)

