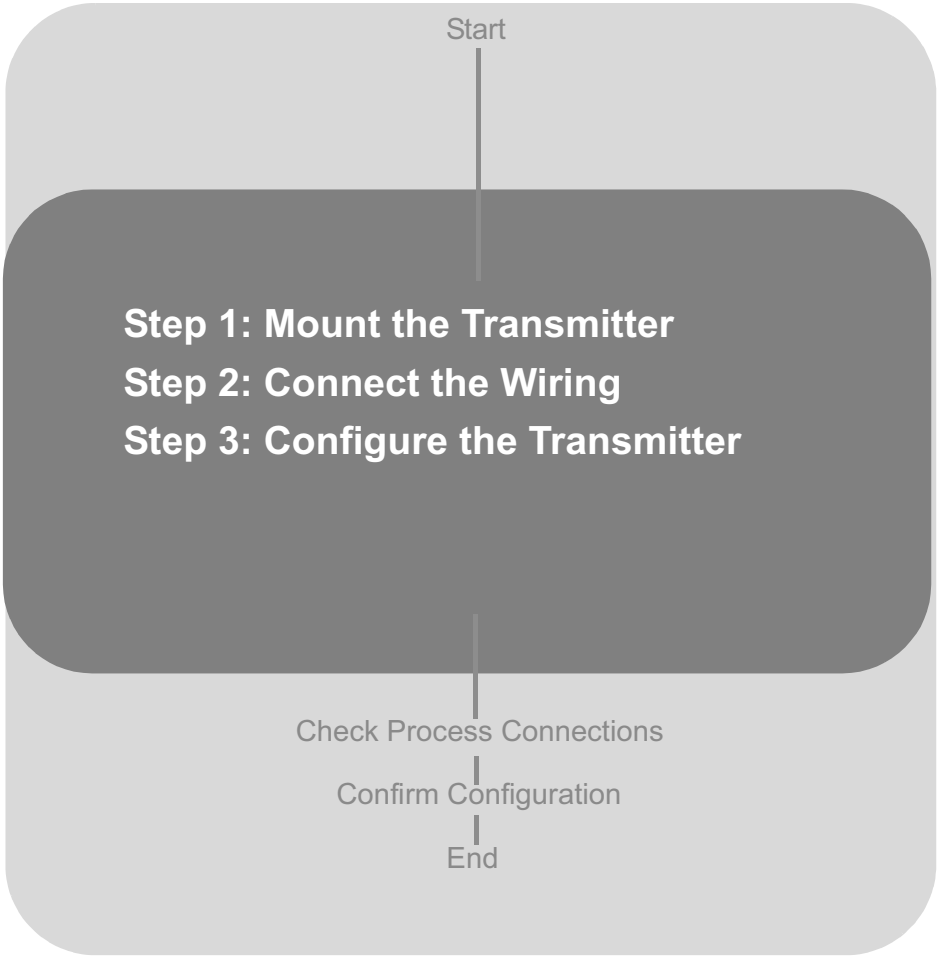
Quick Installation Guide
00825-0100-4840, Rev AB
January 2008

Rosemount 3100 Series

Rosemount 3100 Series Ultrasonic Level Transmitter



ROSEMOUNT®

www.rosemount.com

EMERSON™
Process Management

Emerson Process Management, Rosemount Inc.

The Americas
Emerson Process Management
8200 Market Boulevard
Chanhassen, MN USA 55317
Tel (U.S.) 1-800-999-9307
Tel (International) (952) 906-8888
Fax (952) 949-7001

Asia Pacific
Emerson Process Management
Singapore Pte Ltd.
1 Pandan Crescent
Singapore 128461
Tel 65 777 8211
Fax 65 777 0947
AP.RMT-Specialist@emerson.com

Europe, Middle East & Africa
Emerson Process Management
Shared Services Ltd.
Heath Place
Bognor Regis
West Sussex PO22 9SH
England
Tel (44) 1243 845500
Fax (44) 1243 867554

⚠ IMPORTANT NOTICE

- This installation guide provides basic guidelines for the Rosemount® 3100 Series. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, or intrinsically safe (I.S.) installations. Refer to the Rosemount 3100 Series Reference Manual (document number 00809-0100-4840) for more instructions. The manual and this Quick Installation Guide (QIG) are also available electronically on www.rosemount.com.

⚠ WARNING

Electrical shock can result in death or serious injury

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.
- Make sure the power to the Rosemount 3100 Series transmitter is off and the lines to any other external power source are disconnected or not powered while wiring the transmitter

Failure to follow safe installation and service guidelines could result in death or serious injury

- Installation and servicing must be carried out by suitably trained personnel in accordance with the local code of practice.
- Use the equipment only as specified in this QIG and the Reference Manual. Failure to do so may impair the protection provided by the equipment.
- The equipment is not intended to be repaired by the user and is to be replaced by an equivalent certified unit. Repairs should only be carried out by the manufacturer or approved repairer. Any substitution of non-recognized spare parts may jeopardize safety. Repair, e.g. substitution of components etc. may also jeopardize safety and is under no circumstances allowed.
- If the equipment is likely to come into contact with aggressive substances, it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

  Aggressive Substances – e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials. Suitable Precautions – e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.
- Verify that the operating environment of the transmitter is consistent with the appropriate hazardous locations specifications. See Product Certifications section in this QIG.

⚠ WARNING

- The Integral Display and Push-buttons are only to be used for the purpose of installation, maintenance, or configuration. The enclosure cover is to be securely fitted at all other times, thus ensuring that the type of protection is not compromised.
- Before connecting a HART®-based Communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Ensure that only suitably certified cable entry devices (not supplied) will be used when connecting this equipment.
- Ensure that any unused cable entries are sealed with suitably certified blanking plugs (*not supplied*).
- This product is classified Type A in accordance with the European EMC directive **2004/108/EC**. To ensure electro-magnetic compatibility, in any member state, this product should **not be** installed in a residential area.

STEP 1: MOUNT THE TRANSMITTER

Figure 1.

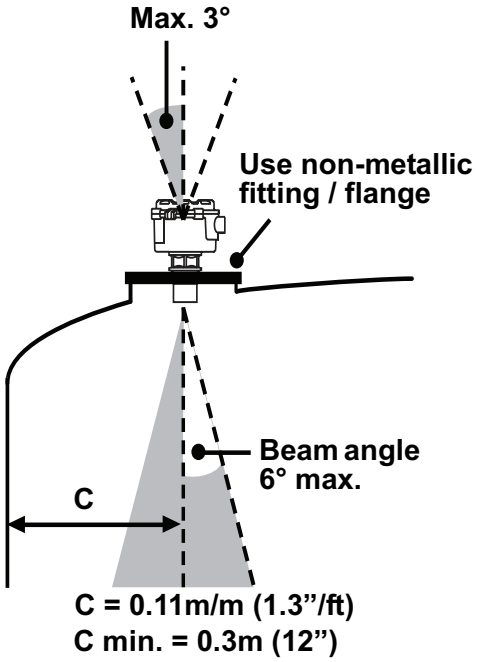


Figure 2.

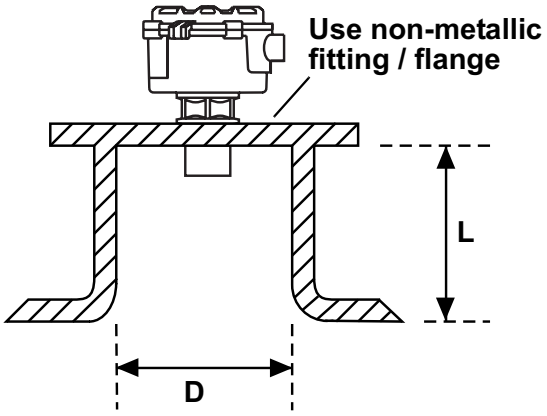
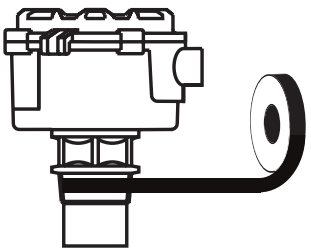


Figure 3.



Mounting considerations

1. Avoid mounting over objects, and disturbed flow.
2. Note maximum and minimum distances from tank wall (see Figure 1, left side.)

Mounting in a nozzle

When installing on a tank that has a nozzle or stand-off, and the transmitter face does not protrude into the vessel (Figure 2, left side), use the recommended dimensions from Table 1.

Table 1.

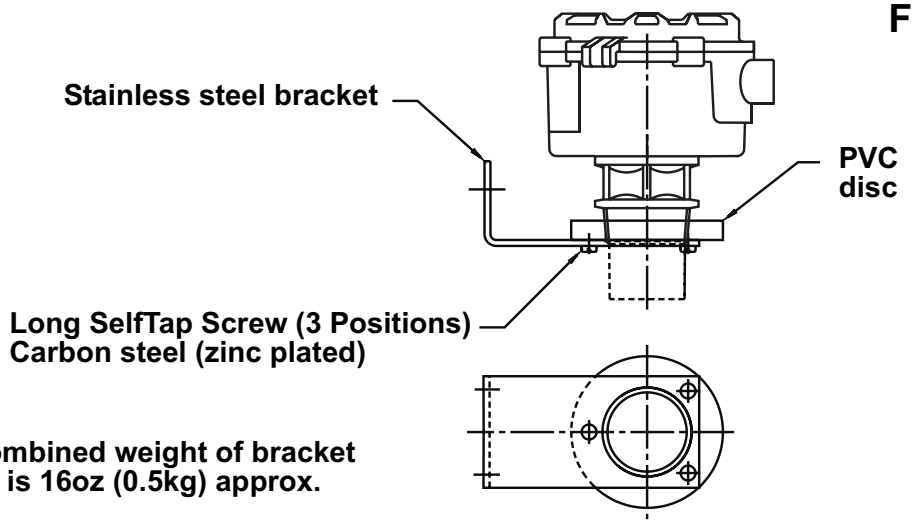
Nozzle Diameter Size (D)	Max Nozzle Length (L)
DN50 (2 inch)	18mm (3/4”)
DN80 (3 inch)	100mm (4”)
DN100 (4 inch)	100mm (4”)
DN125 (5 inch)	200mm (8”)
≥DN150 (6 inch)	350mm (14”)

Threaded Tank Connection

1. Use PTFE tape on the screw thread (Figure 3, left side.)
2. Lower transmitter into the tank through the process connection.
3. Turn the transmitter until it is properly secured in the process connection.
4. Tighten to 1.5 lbf.ft (2 Nm) using the hexagon. **Do not use housing to tighten**.

Mounting with optional bracket kit

Figure 4.



Note: Combined weight of bracket and disc is 16oz (0.5kg) approx.

When installing using a bracket kit:

1. Attach the bracket to the disc using the 3 screws provided (see Figure 4 and Figure 5.)
2. Attach the bracket and disc to a support.
3. Use PTFE tape on the screw thread of the transmitter (see Figure 6.)
4. Insert the transmitter into disc.
5. Tighten to 1.5 lbf.ft (2 Nm) using the hexagon. **Do not use the housing to tighten**.

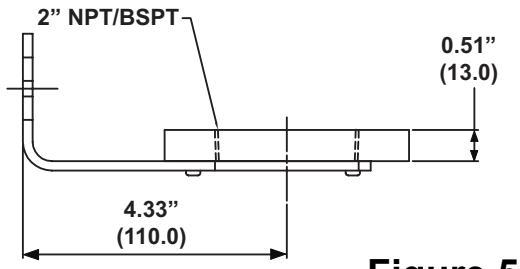


Figure 5.

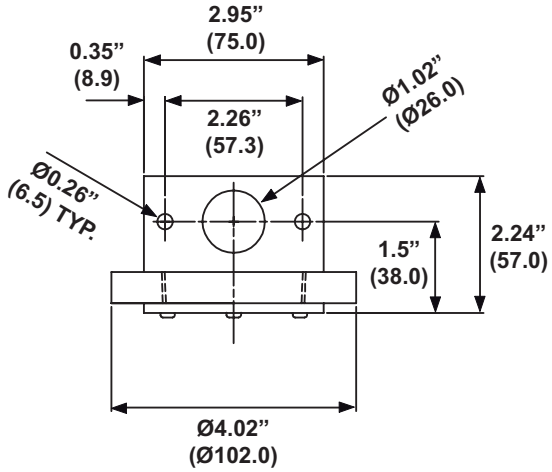
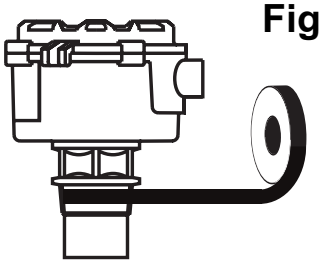


Figure 6.



NOTE:
The bracket kit contains a stainless steel angle bracket and PVC threaded disc, which may be used to mount the transmitter on a support over the liquid surface.

STEP 2: CONNECT THE WIRING

The Rosemount 3100 Series is a 2-wire loop-powered transmitter accepting power supplies as follows:

- Model 3101: 12-30VDC
- Model 3102: 12-40VDC
- Model 3105: 12-40VDC (non-hazardous), 12-30VDC (hazardous).

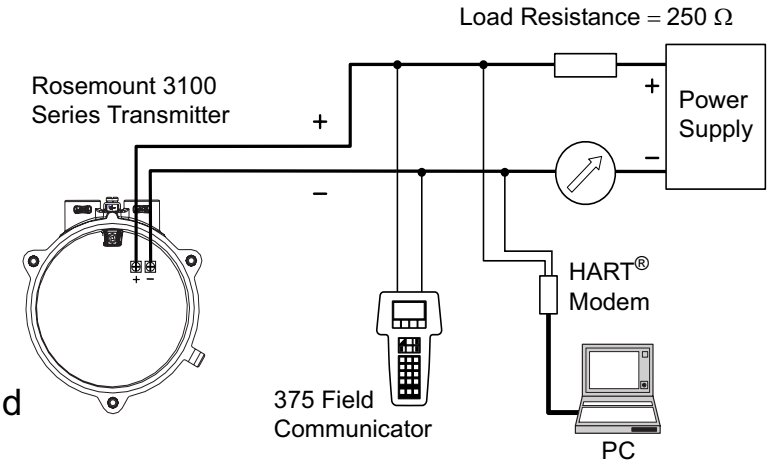
The transmitter requires shielded twisted pair wiring (18-12 AWG) that is suitable for the supply voltage and approved for use in hazardous areas.

To Connect the Transmitter

1. Make sure the housing is grounded in accordance with Hazardous Locations Certifications, national and local electrical codes.
2. Make sure the power supply is disconnected.
3. Remove the transmitter cover.
4. Pull the cable through the cable gland / conduit.
5. Connect wires as illustrated below.
6. If applicable, seal the unused port.
7. Replace the cover and tighten, also tightening the cable gland.
8. Connect the power supply.

Non-Intrinsically Safe Output

Figure 7.



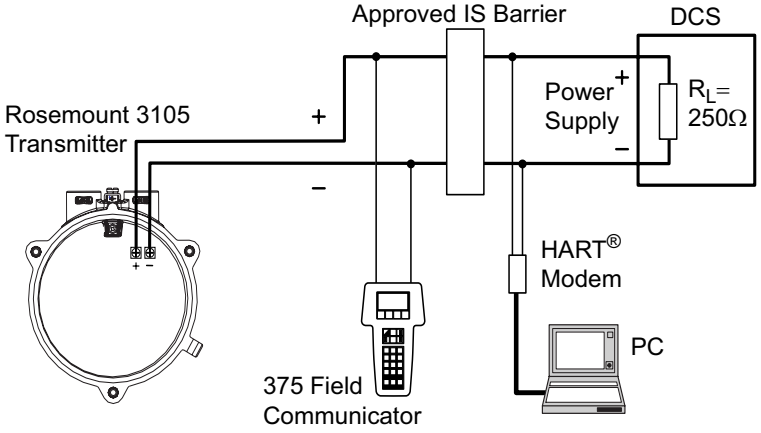
Transmitter Terminals:
Terminal 1 (+): +24 VDC
Terminal 2 (-): 0 VDC
(Connect screen to ground in the control room).

Intrinsically Safe Output

Figure 8.

IS Parameters: Ui = 30 V, Ii = 120 mA, Pi = 0.82 W, Li = 108μH, Ci = 0 nF

Transmitter Terminals:
Terminal 1 (+): +24 VDC
Terminal 2 (-): 0 VDC
(Connect screen to ground in the control room).



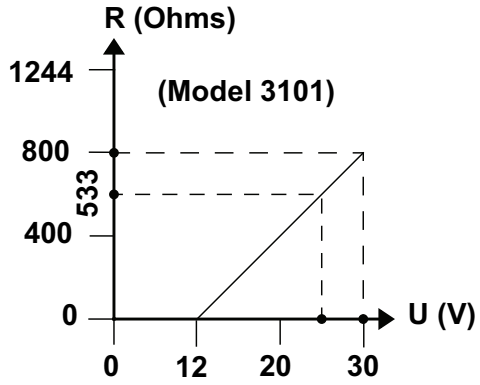
The Rosemount Field Communicator requires a minimum load resistance of 250 Ohm within the loop to function properly (see “Load Limitations” on page 9)

If using a Rosemount 3490 Series Control Unit, do not include the additional resistor, or the IS Barrier.

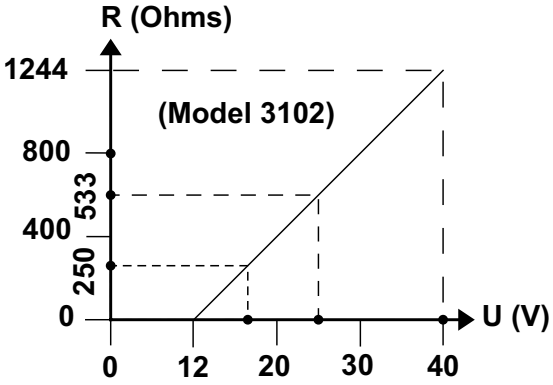
Load Limitations

Figure 9.

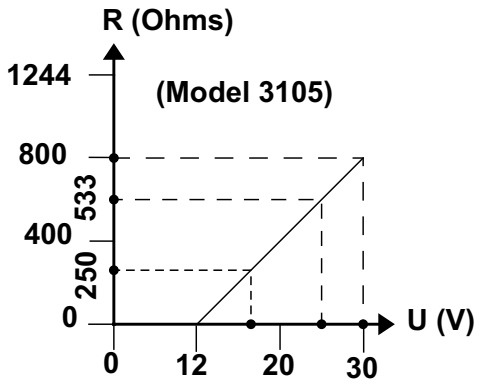
Non-Intrinsically Safe Installation:



Non-Intrinsically Safe Installation:



Intrinsically Safe Installation:

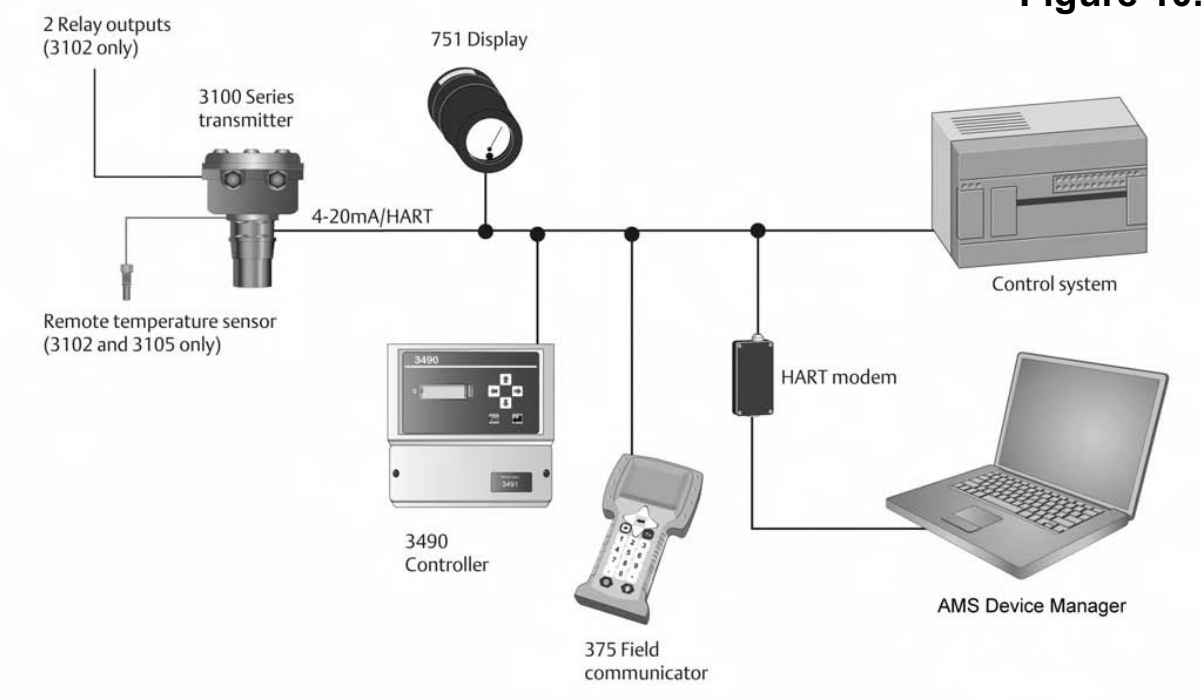


STEP 3: CONFIGURE THE TRANSMITTER

Configuration of the Rosemount 3100 Series transmitter can be done with the Integral Display and Push-Buttons. Rosemount transmitter models 3102 and 3105 can use a Rosemount 3490 Series Control Unit, a 375 Field Communicator, or PC with AMS(TM) Suite: Intelligent Device Manager.

NOTE:
If the transmitter was configured at the factory, it is not necessary to proceed with this step, unless you need to verify / change the settings. For detailed configuration steps, refer to the reference manual (00809-100-4840).

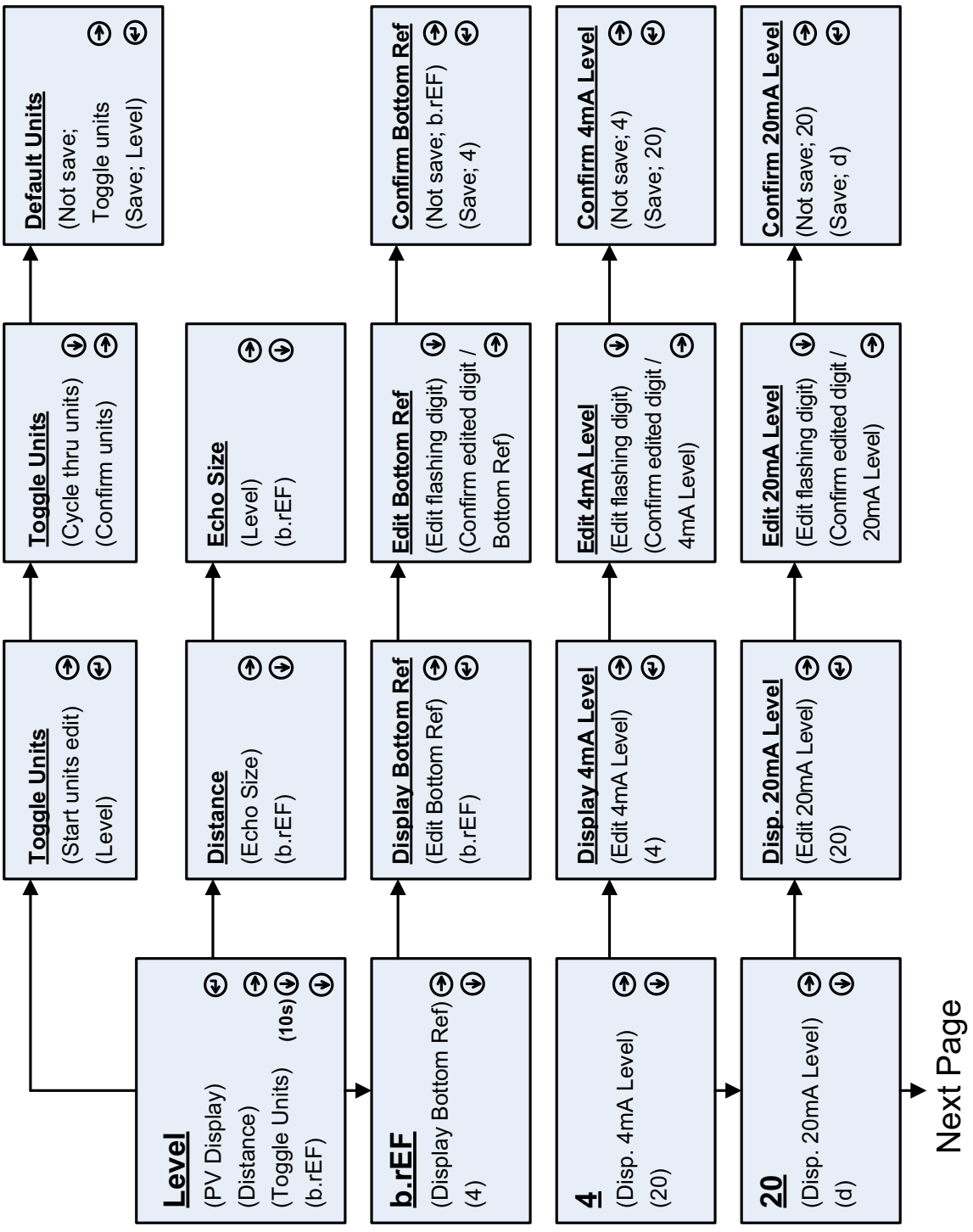
Figure 10.



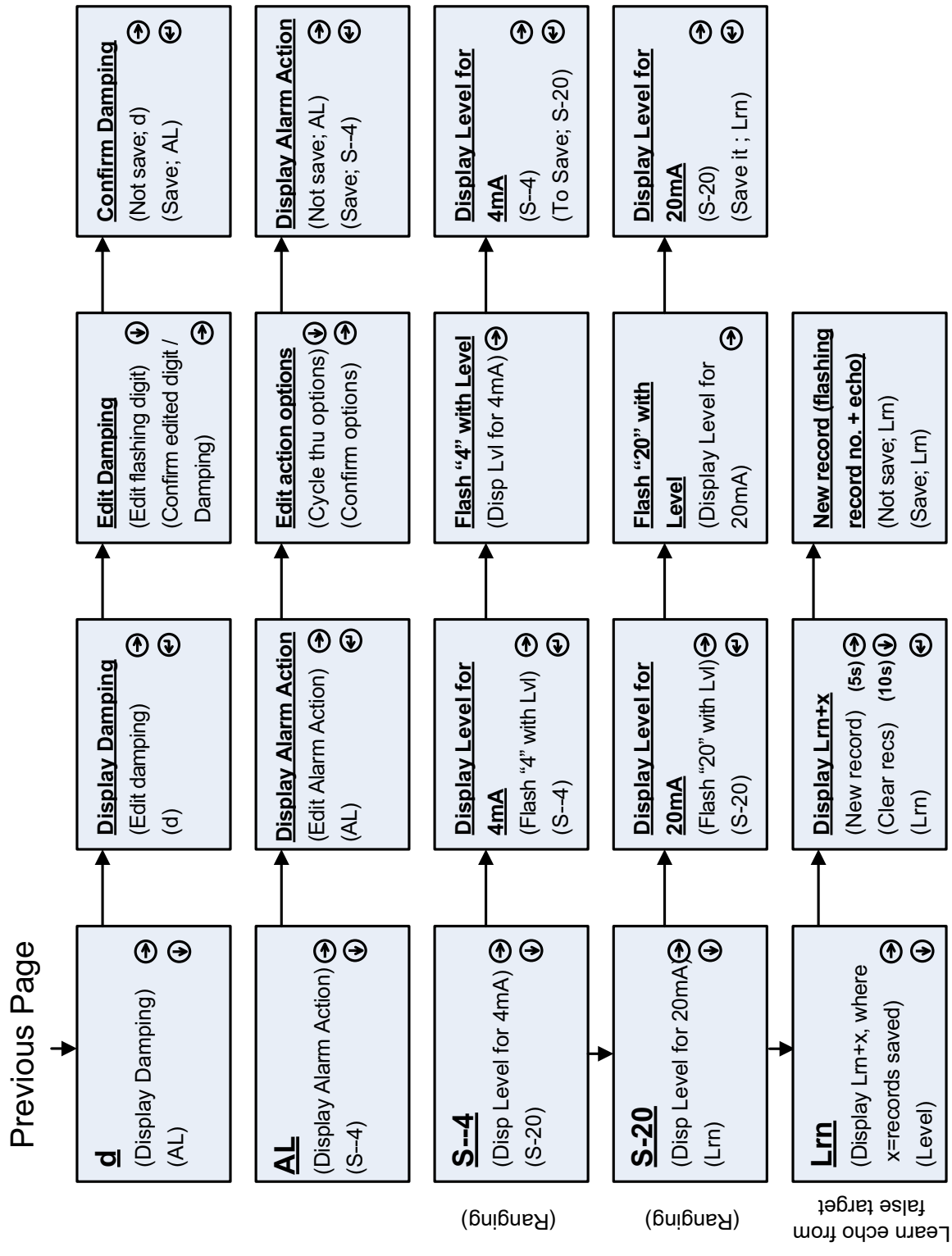
Rosemount 3100 Series ultrasonic level transmitters can be configured by using the Integral push-buttons and display.
Please refer the “Integral Display Menu (Model 3101)” diagram below for the model 3101 menu structure and instructions to edit parameters.

For models 3102 or 3105, please refer to the “Integral Display Menus (Models 3102/3105)” diagram on page 13.

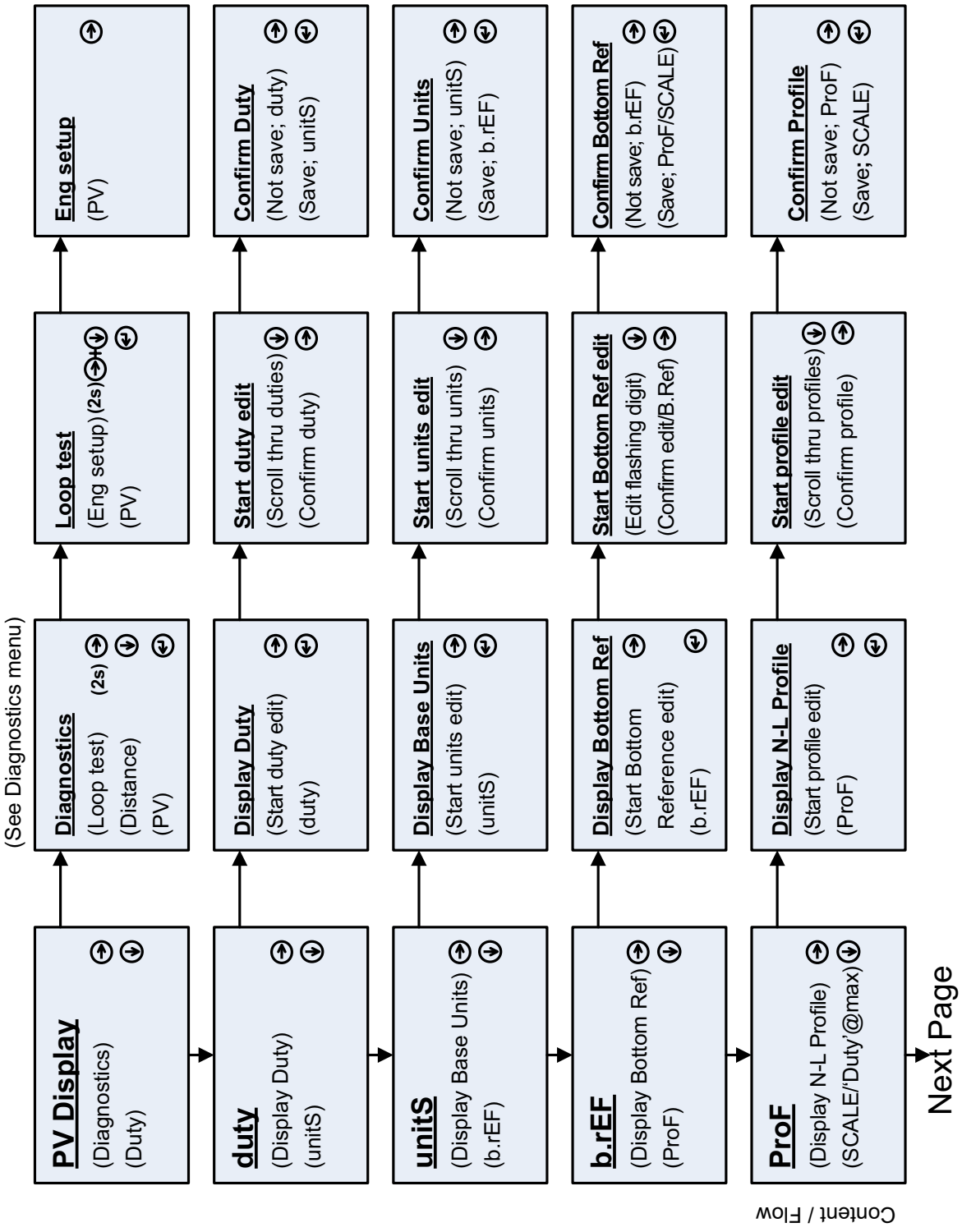
Integral Display Menu (Model 3101)



Integral Display Menu (Model 3101) continued...

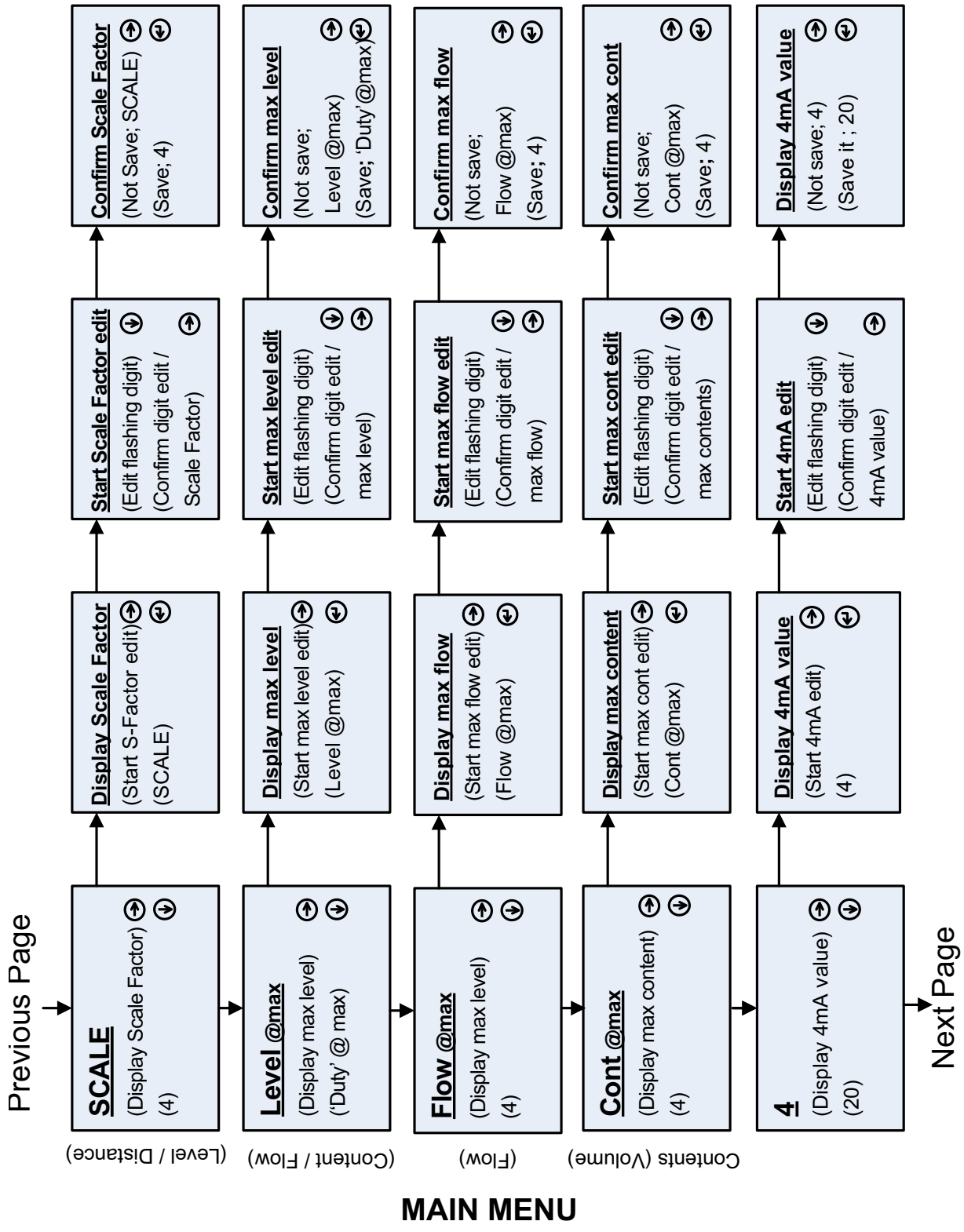


Integral Display Menus (Models 3102/3105)

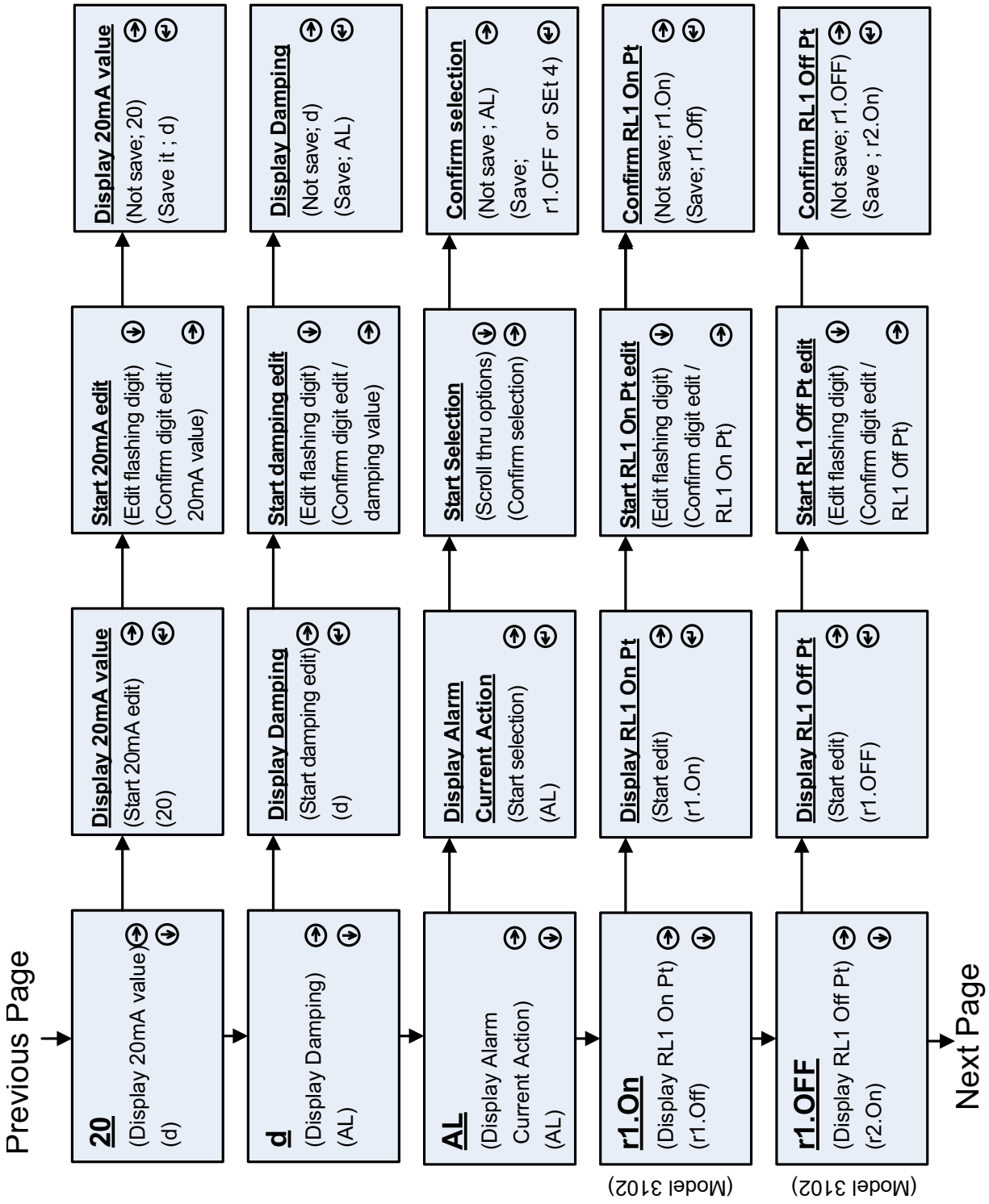


MAIN MENU

Integral Display Menus (Models 3102/3105) continued...

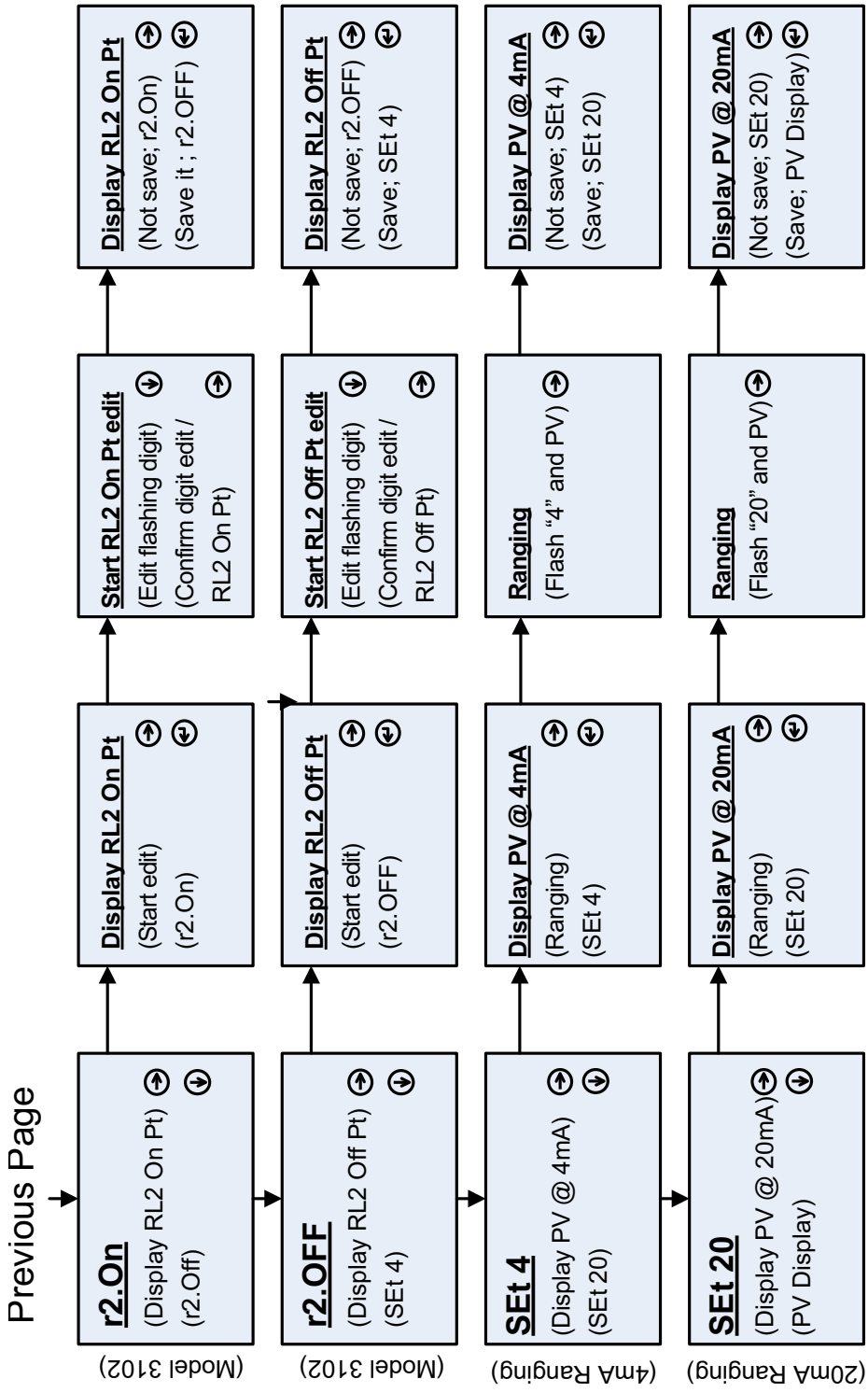


Integral Display Menus (Models 3102/3105) continued...



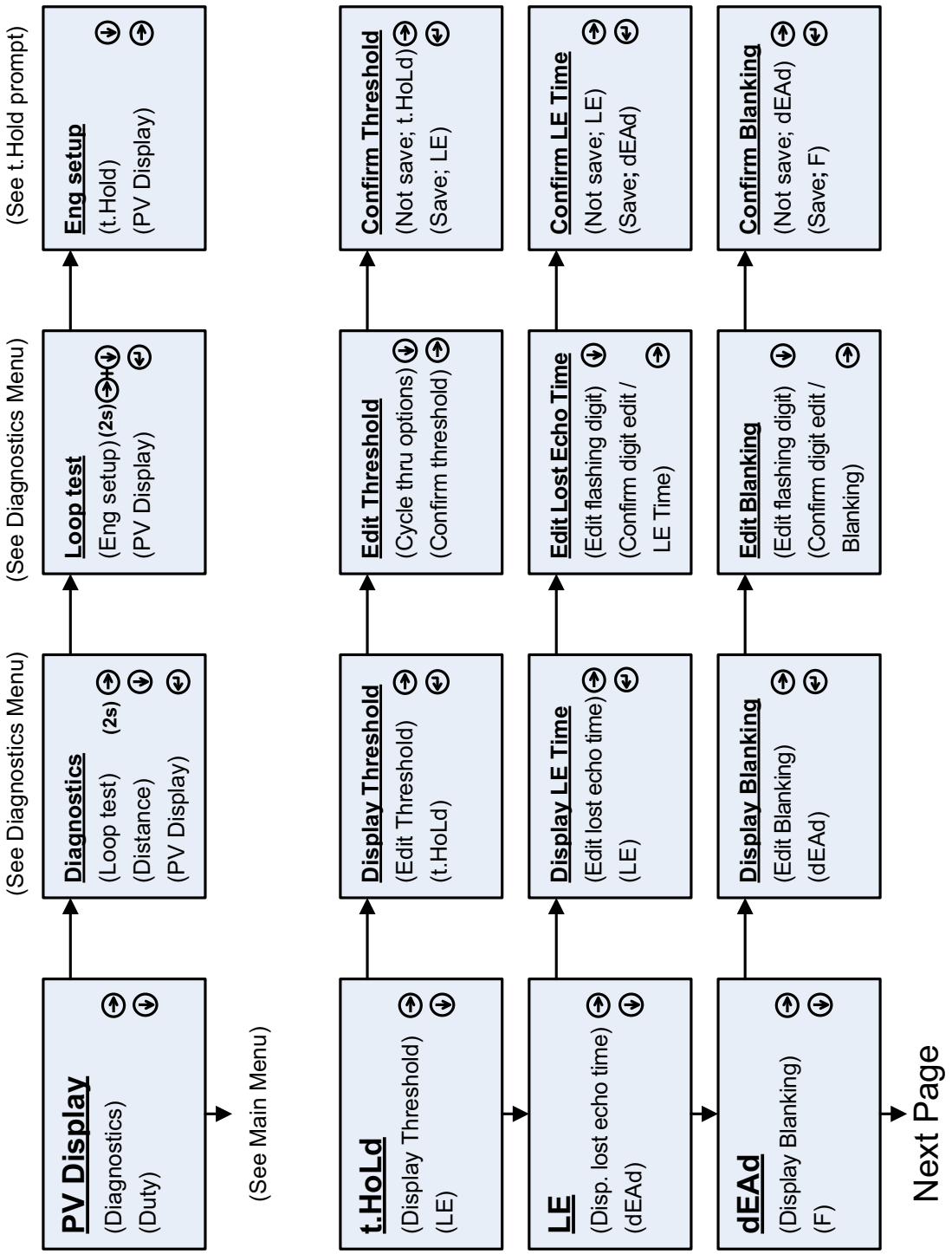
MAIN MENU

Integral Display Menus (Models 3102/3105) continued...



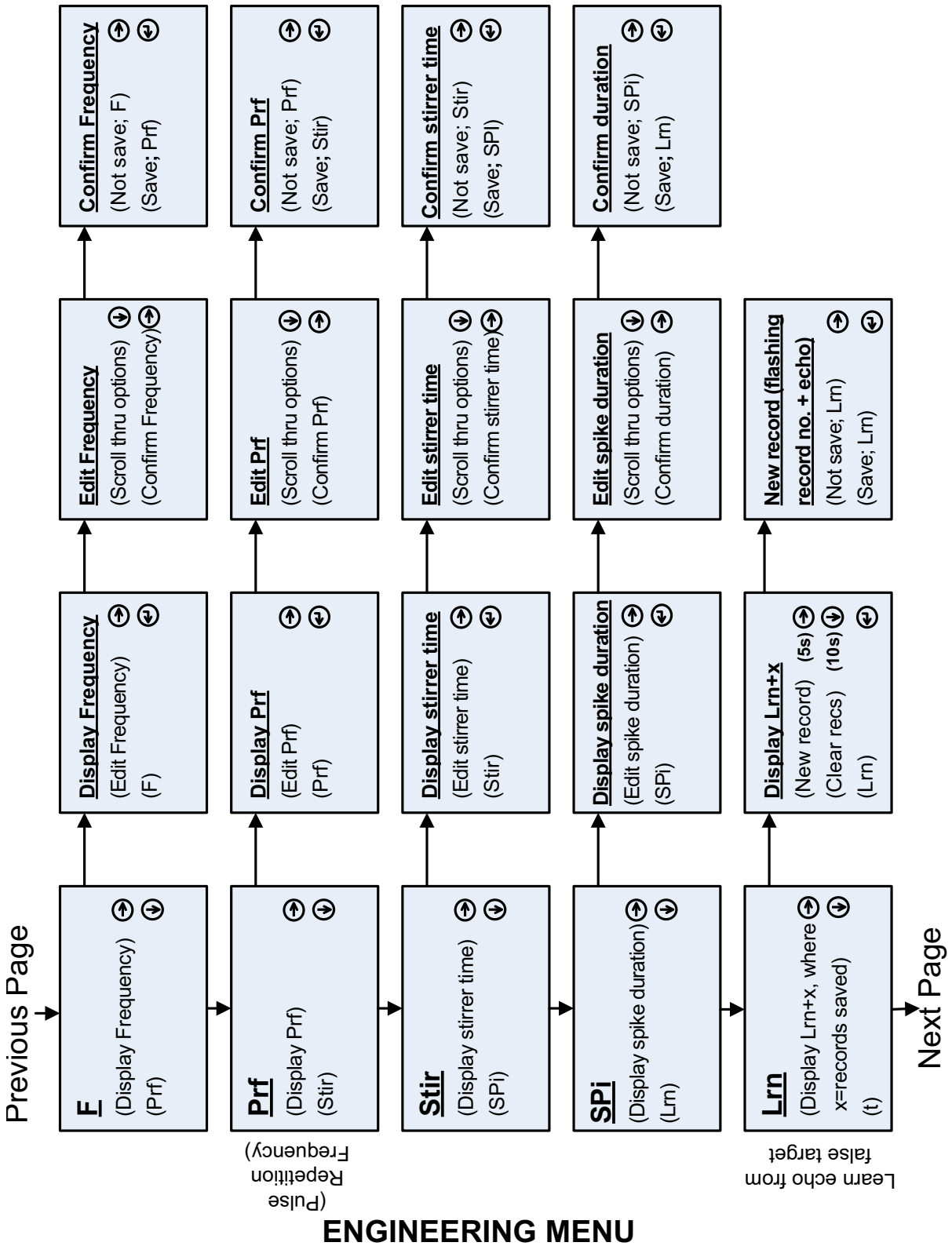
MAIN MENU

Integral Display Menus (Models 3102/3105) continued...

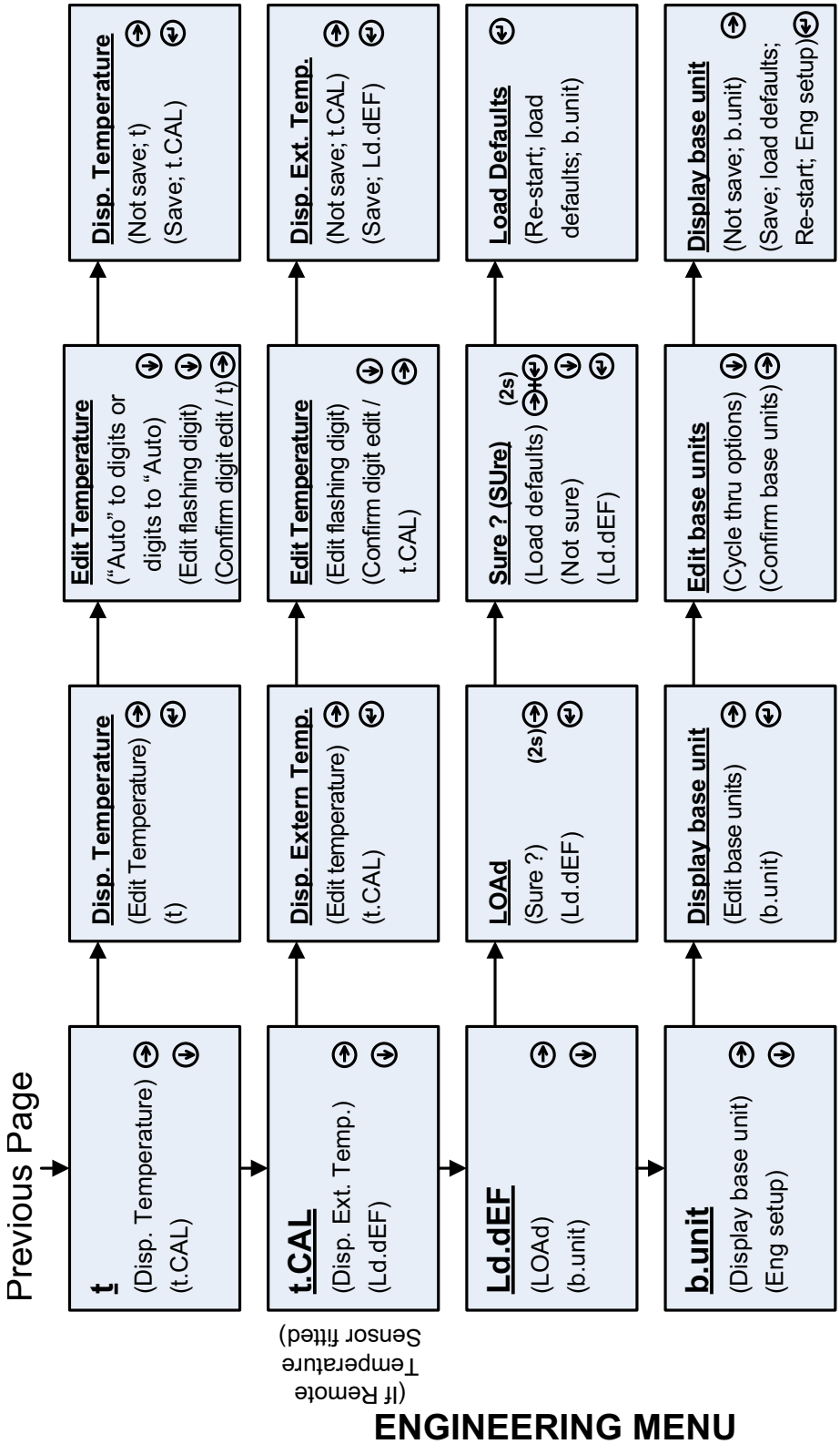


ENGINEERING MENU

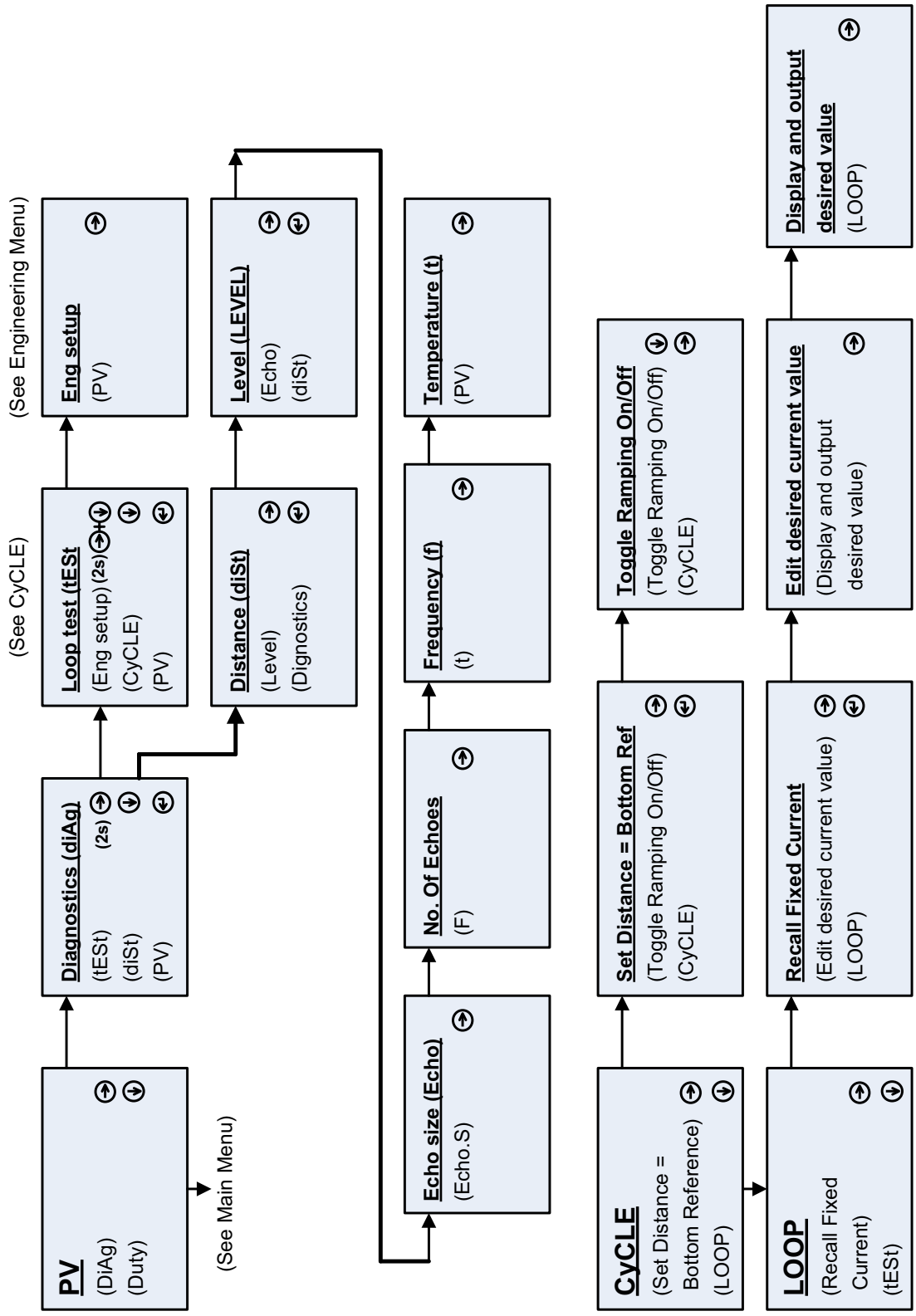
Integral Display Menus (Models 3102/3105) continued...



Integral Display Menus (Models 3102/3105) continued...



Integral Display Menus (Models 3102/3105) continued...



DIAGNOSTICS MENU

Product Certifications

NOTE:
A safety isolator such as a zener barrier is needed for intrinsic safety.

Factory Mutual (FM) Approvals

(Models 3101/3102)

Factory Mutual (FM) Ordinary Location Approval

G5 Project ID: 3024095
The transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

(Model 3105)

Factory Mutual (FM) Intrinsically Safe Approval

I5 Project ID: 3024095
Intrinsically Safe for Class I, Div. 1, Groups A, B, C and D
Intrinsically Safe for Class I, Zone 0, AEx ia IIC
Temperature Code: T4 at +60°C, max ambient
Temperature Code: T6 at +55°C, max ambient
Control Drawing: 71097/1216
Ui = 30 V, Ii = 120 mA, Pi = 0.82 W, Li = 108μH, Ci = 0 nF.

Factory Mutual (FM) Non-Incendive Approval

I5 Project ID: 3024095
Non-Incendive for Class I, Div. 2, Groups A, B, C and D
Non-Incendive for Class I, Zone 2, AEx nA IIC
Temperature Code: T4 at +60°C, max ambient
Temperature Code: T6 at +55°C, max ambient
Control Drawing: 71097/1216
Ui = 30 V, Ii = 120 mA, Pi = 0.82 W, Li = 108μH, Ci = 0 nF

Canadian Standards Association (CSA) Approvals

(Models 3101/3102)

Canadian Standards Association (CSA)
Ordinary Location Approval

Project ID: 1878089

G6 The transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by CSA, a nationally recognized testing laboratory as accredited by the Standards Council of Canada (SCC).

Special conditions for safe use:

The power for the Rosemount 3100 Series must be supplied from a 3490 Series Control Unit, or from a class 2 or SELV source.

(Model 3105)

Canadian Standards Association (CSA)
Intrinsically Safe Approval

I6 Project ID: 07CSA1878089X
Intrinsically Safe for Class I, Div. 1, Groups A, B, C, and D
Intrinsically Safe for Class 1, Zone 0, Ex ia IIC
Temperature Code:
T4 (T_{amb} -40°C to +60°C) and T6 (T_{amb} -40°C to +55°C)
Control Drawing: 71097/1218
Ui = 30 V, Ii = 120 mA, Pi = 0.82 W, Li = 108μH, Ci = 0 nF

Canadian Standards Association (CSA)
Non-Incendive Approval

I6 Project ID: 07CSA1878089X
Non-Incendive for Class I, Div. 2, Groups A, B, C, and D
Non-Incendive for Class I, Zone 2, Ex nL IIC
Temperature Code:
T4 (T_{amb} -40°C to +60°C) and T6 (T_{amb} -40°C to +55°C)
Control Drawing: 71097/1218
Ui = 30 V, Ii = 120 mA, Pi = 0.82 W, Li = 108μH, Ci = 0 nF

ATEX Intrinsically Safe Approval

(Model 3105)

I1 Certificate: Sira 06ATEX2260X
Intrinsically Safe for II 1 G, EEx ia IIC
Temperature Class:
T4 (T_{amb} -40°C to +60°C)
T6 (T_{amb} -40°C to +55°C)
Ui = 30 V, Ii = 120 mA, Pi = 0.82 W, Li = 108μH, Ci = 0 nF

Special conditions for safe use:

1. The equipment may be used with flammable gases and vapors with apparatus groups IIA, IIB, and IIC, and with temperature classes T1, T2, T3, T4, T5, and T6.
2. The apparatus electronics is only certified for use in ambient temperatures in the range of -40ºC to +60ºC (for T4), or -40ºC to +55ºC (for T6). It should not be used outside this range.
3. Materials of construction:

Probe:	PVDF.
Housing and cover:	Aluminium alloy.
Lid seal:	Silicone.

4. All transmitter models have external plastic parts, which could present a risk of ignition due to electrostatic charge build-up. They shall not be directly installed in any process where its enclosure might be charged by the rapid flow of non-conductive media.
5. All transmitter models shall only be cleaned with a cloth.
6. When the transmitter housing uses aluminium alloy in its construction, this presents a risk of ignition due to impact and shall be taken into consideration on installation and use.

IECEx Intrinsically Safe Approval

(Model 3105)

I7 Certificate: IECEx SIR 06.0068X
Intrinsically Safe for Zone 0, Ex ia IIC
Temperature Class:
T4 (T_{amb} -40°C to +60°C)
T6 (T_{amb} -40°C to +55°C)
Ui = 30 V, Ii = 120 mA, Pi = 0.82 W, Li = 108μH, Ci = 0 nF

Special conditions for safe use:

1. The equipment may be used with flammable gases and vapors with apparatus groups IIA, IIB, and IIC, and with temperature classes T1, T2, T3, T4, T5, and T6.
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Housing and cover:	Aluminium alloy.
Lid seal:	Silicone.

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