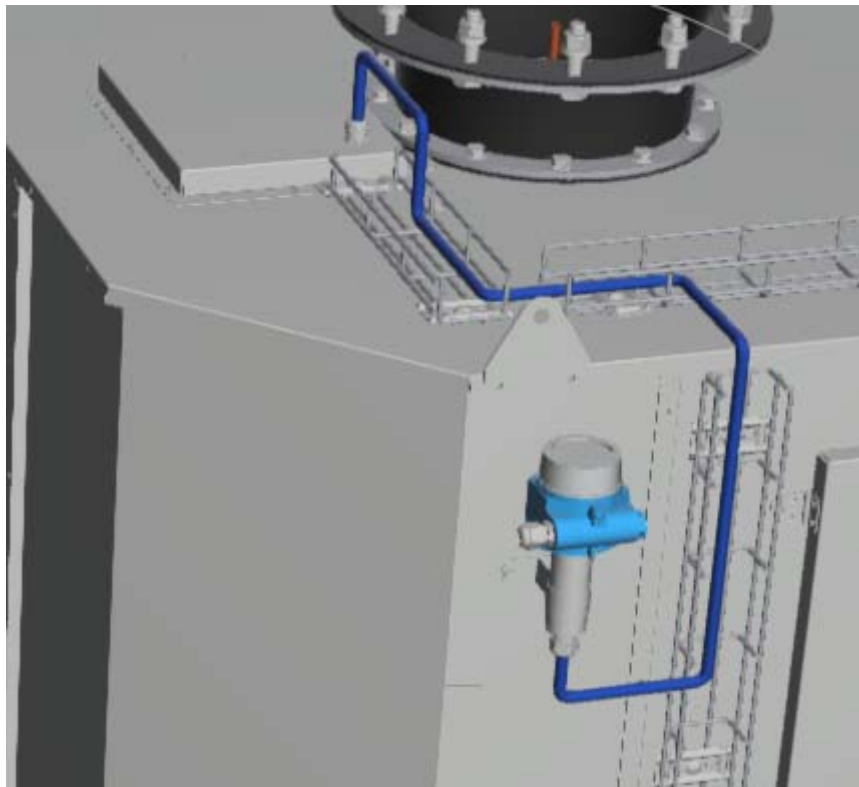
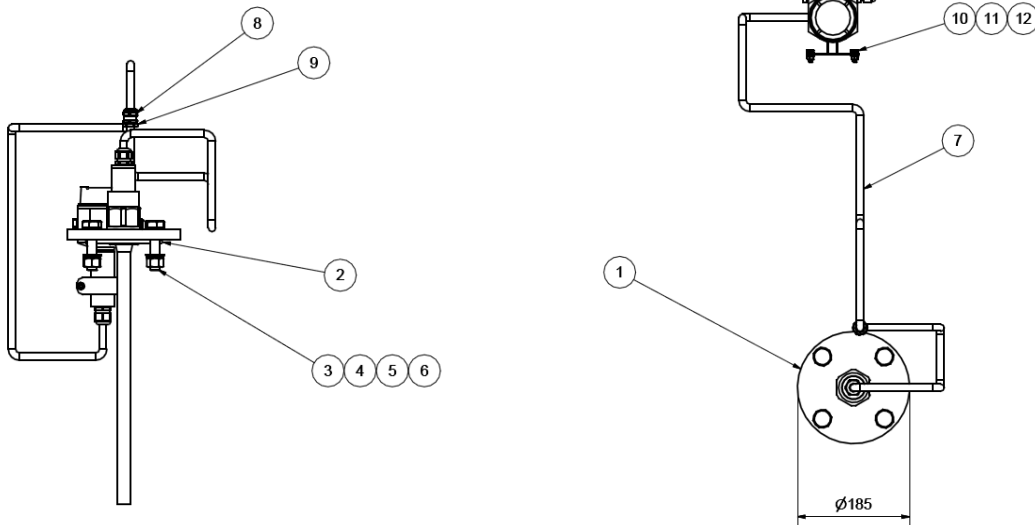


IMPLEMENTATION OF LEVEL TRANSMITTER IN GAS TRAP



Parts included:



12	2	Screw hex M6x16 A4-80	Stainless Steel	ISO 4017	0	22223	22223
11	2	Nut, M6, A4	Stainless Steel	DIN 934	0	10846	10846
10	4	Washer 6, A4	Stainless Steel	DIN 125A	0	10850	10850
9	1	Lock Nut for Cable Gland M20, Brass	Brass	-	0	21052	21052
8	1	Cable Gland, M20, Brass	Brass	-	0,1	21045	21045
7	1	Liquicap, Capacitive lev. trans, Rod, PTFE Coated. Sep. Hous	-	-	5,8	23107	23107
6	4	Nut, M16, A4	Stainless Steel	ISO 4032	0	10856	10856
5	4	Screw, M16 x 70mm, A4	Stainless Steel	ISO 4014	0,2	11300	11300
4	4	Washer M16 A4 , Split lock	Steel, Mild	DIN127B	0	11407	11407
3	8	Washer M16 A4	Stainless Steel	ISO 7089	0	10853	10853
2	1	Flange gasket, DN65, d75, EPDM	Rubber	-	0	11883	11883
1	1	Blimd Flange DN65 with G1 1/2 Hole, AISI 316L	-	-	3,5	503026	503026
POS	QTY	TITLE	MATERIAL	STANDARD	MASS	DWG.NO	ART.NO



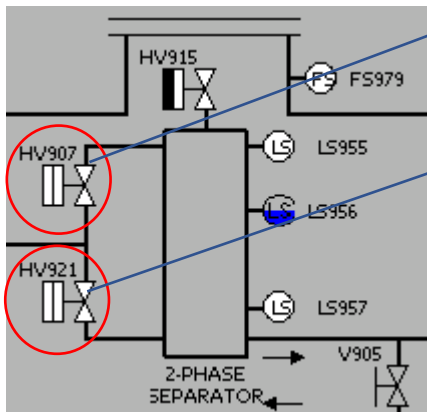
7	20	Nut, M5, A4	Stainless Steel	ISO 4032	0	23218	23218
6	20	Washer M5 DIN125 A4	Stainless Steel	ISO 7089	0	23217	23217
5	20	Screw, M6x16, Pozdrive, A4	Stainless Steel	ISO 7047	0	23216	23216
4	1	Gasket for Liquicap Hatch	PVC, Flexible	-	0	503052	503052
3	1	Hatch for Liquicap, Plate 02	Stainless Steel	-	1,2	503033	503033
2	2	Hinge 60x40, AISI 316L	-	-	0	23094	23094
1	1	Hatch for Liquicap, Plate 01	Stainless Steel	-	0,5	503029	503029
POS	QTY	TITLE	MATERIAL	STANDARD	MASS	DWG.NO	ART.NO

In addition to the above parts we need:

- 10 meters of 2x0,75mm² twisted pair with screen
- Analog barrier Art. No. 12418
- RK wire (White, Red and Blue. 5 meters of each)
- Ferrules 0,75mm², black tape

A. Installation of sensor

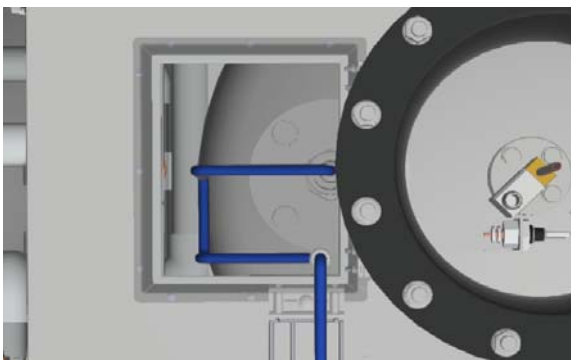
1. If the washing valves for gas trap is installed on this skid, we must remove it, install a blind flange and remove from the software.



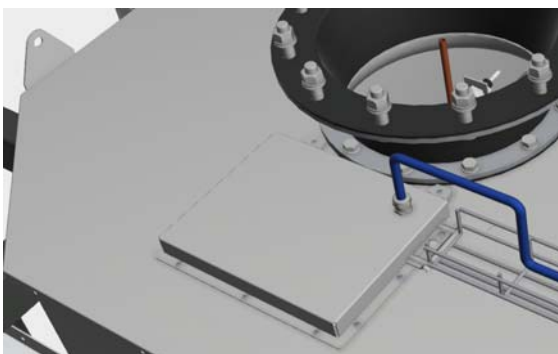
Remove pipe and
install blind flange.
Remove from software

Remove from software
and leave always open

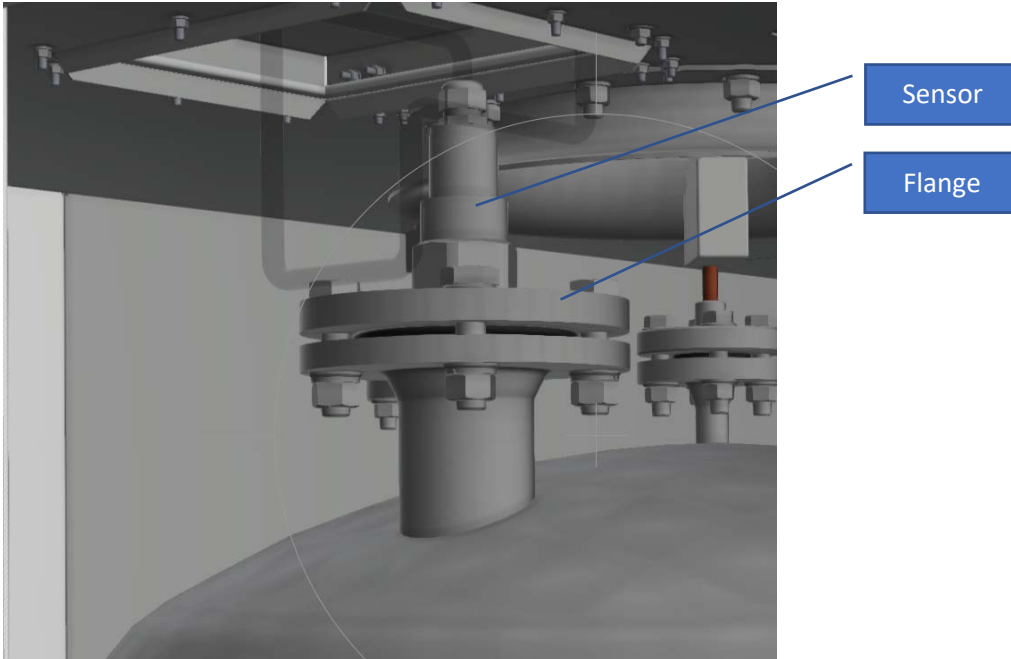
2. Make a cut out on the hood to fit the new hatch



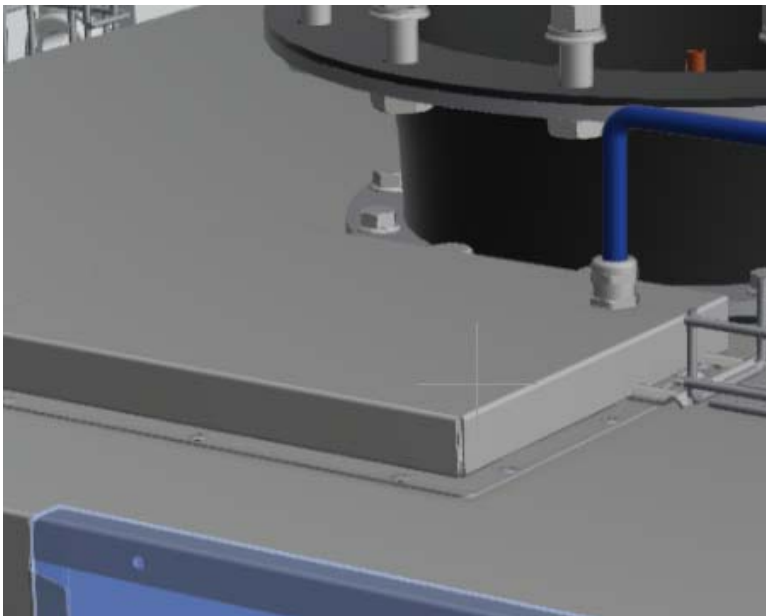
3. Install the new hatch



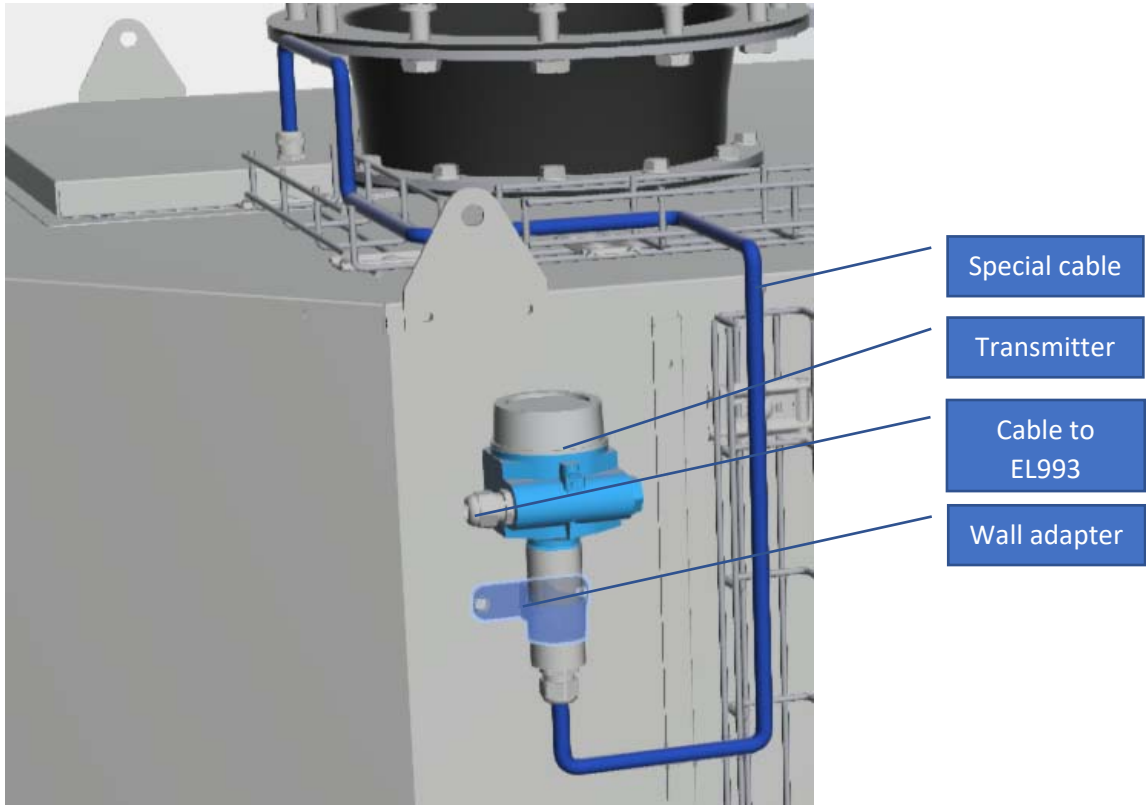
4. Install the threaded DN65 flange and sensor



5. Connect the 2-meter special cable to the sensor and pull it out through the cable gland



6. Mount the transmitter head outside the hood with the wall adapter. Connect special cable from the sensor and the cable from transmitter to EL993 (2x0,75mm² Twisted pair)



7. Remove the barriers for Baumer LS switches in gas trap
8. Install the barrier in EL993



24-Mar-20

9. Find a spare analog input on the PLC in EL993 and connect wires from barrier
10. Connect 24VDC to the barrier
11. Connect 2x0,75mm² cable from sensor to the barrier via the blue terminals

Make as-built drawing for electrical installation

B. Software

This is an example on how we can implement software for the analog level sensor in gas trap

1. Create a new variable called IN_LT959

The screenshot shows the Siemens SIMATIC Manager interface for a project named 'C2E MK2 VF KRAFT'. The 'PLC AI Tags' table is visible, listing 15 tags. The 14th tag, 'IN_LT959', is highlighted, showing its configuration details.

	Name	Data type	Address	Retain	Visibl...	Acces...
1	IN_FT941	Int	%IW288		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	IN_FT942	Int	%IW290		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	IN_FT952	Int	%IW292		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	IN_FT953	Int	%IW294		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	IN_FT954	Int	%IW296		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	IN_IA951	Int	%IW298		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	IN_FT944	Int	%IW300		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	IN_PA975	Int	%IW302		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9	IN_HV902	Int	%IW304		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
10	IN_HV903	Int	%IW306		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
11	IN_HV904	Int	%IW308		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12	IN_HV905	Int	%IW310		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13	IN_HV910	Int	%IW312		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
14	IN_LT959	Int	%IW314	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
15	<Add new>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

2. Scale the new analog input 0-100%

The screenshot shows the SIMATIC Manager interface for configuring a new network for the FB INSTRUMENT block. The 'Interface' table is as follows:

Name	Data type	Offset	Default value	Visible in ...	Comment
1	Input				
2	<Add new>				

The block title is **FB INSTRUMENTIT**. The networks are:

- Network 1: SETPOINTS
- Network 2: FM952
- Network 3: FM953
- Network 4: FM954
- Network 5: FS979
- Network 6: IA951
- Network 7: LT959 Scale 0 - 100%

The configuration for Network 7 is shown in the diagram below:

```

    graph LR
      EN[EN] --- SCALE[SCALE]
      IN["IN: %IW314  
\"LT959\""] --- IN_LIM["HI_LIM: 100.0  
LO_LIM: 0.0"]
      SCALE --- RET_VAL["RET_VAL: %MW2  
Diagnostic"]
      SCALE --- OUT["OUT: %MD6  
\"LT959_Scaled\""]
      FALSE["FALSE"] --- BIPOLAR["BIPOLAR"]
    
```

Below the diagram is a table of tag assignments:

"IN_LT959"	%IW314	
"FALSE"	%M0.4	
"LT959_Scaled"	%MD6	
"LT959_Diagnostic"	%MW2	

3. Use the scaled analog signal to create new digital signals for LS955,956,957

The screenshot displays the SIMATIC Manager interface for a PLC program. The left pane shows the project tree with the following structure:

- Project tree
 - Devices
 - FESTO IO
 - PLC IO
 - PLC AI Tags [14]
 - PLC AO Tags [5]
 - PLC DI Tags [18]
 - PLC DO Tags [22]
 - PLC Tags [2]
 - PLC data types
 - Watch and force tables
 - Program info
 - PLC alarms
 - Text lists
 - Local modules
 - 1EL993VF_PLC [CPU 315-2 ...]
 - DIGITAL INPUT SLOT 4
 - DIGITAL OUTPUT SLOT 5
 - ANALOG INPUT SLOT 6
 - ANALOG INPUT SLOT 7
 - ANALOG OUTPUT SLOT 8
 - Distributed I/O
 - PROFINET IO-System (100)...
 - DP-Mastersystem (1): 1EL9...
 - EL101_PLC [CPU 317F-2 PN/DP]
 - Device configuration
 - Online & diagnostics
 - Program blocks
 - Add new block
 - Main [OB1]
 - System blocks
 - Technology objects
 - External source files
 - PLC tags
 - PLC data types
 - Watch and force tables
 - Program info
 - PLC alarms

The main workspace shows the ladder logic for three networks:

- Network 8:** Labeled "LS955 generated from LT959 Analog signal". The logic consists of a normally open contact labeled "LT959_Scaled" with a value of 99.0, connected to a coil labeled "LS955_from_Analog" with address %M0.0.
- Network 9:** Labeled "LS956 low generated from LT959 Analog signal". The logic consists of a normally open contact labeled "LT959_Scaled" with a value of 48.0, connected to a coil labeled "LS956_from_Analog" with address %M0.1.
- Network 10:** Labeled "LS956 high generated from LT959 Analog signal". The logic consists of a normally open contact labeled "LT959_Scaled" with a value of 52.0, connected to a coil labeled "LS956_from_Analog" with address %M0.1.
- Network 11:** Labeled "LS957 generated from LT959 Analog signal". The logic consists of a normally open contact labeled "LT959_Scaled" with a value of 25.0, connected to a coil labeled "LS957_from_Analog" with address %M0.2.

Each network includes a comment field and a variable declaration table at the bottom:

- Network 8 table:

"LS955_from_Analog"	%M0.0
"LT959_Scaled"	%MD6
- Network 9 table:

"LS956_from_Analog"	%M0.1
"LT959_Scaled"	%MD6
- Network 10 table:

"LS956_from_Analog"	%M0.1
"LT959_Scaled"	%MD6
- Network 11 table:

"LS957_from_Analog"	%M0.2
"LT959_Scaled"	%MD6

4. Connect the new digital LS signals to the LS function block

The screenshot displays the SIMATIC Manager interface for a PLC project. The left pane shows the 'Project tree' with a 'Devices' list containing various function blocks (FB) such as FB INSTRUMENT [FB500]. The main workspace shows the 'Interface' table and a ladder logic network (Network 11) where a digital signal is being connected to the 'FB 2PS Level Switch Level High' block.

Name	Data type	Offset	Default value	Visible in ...	Comment
1	Input				
2	<Add new>				

Network 11: LS955

The network diagram shows the following connections:

- Input: `%MD6` (Real, 100.0) connected to `">=` (Real, 100.0)
- Output: `"LS955_from_Analog"` (M0.0) connected to `"LS955_from_Analog"` (M0.0)
- Function Block: `"FB 2PS Level Switch Level High"` (FB513) with `EN` input and `ENO` output.
- Inputs to FB:
 - `%DB101.DBX6.0` (DB System) RESET.OUT.RESET_ ON → `IN_RESET`
 - `%M0.0` ("LS955_from_Analog") → `IN_LEVEL_SWITCH`
 - `%DB501.DBX576.2` ("DB Instrument" LS956.OUT.FIRST_LEVEL_LOW) → `IN_FIRST_LEVEL_LOW`
- Output from FB: `OUT` → `LS955.OUT` (DB Instrument) DBX566.0

24-Mar-20

Project Edit View Insert Online Options Tools Window Help

Save project Go online Go offline

C2E MK2 VF KRAFT ET > 1EL993VF_PLC [CPU 315-2 PN/DP] > Program blocks > FB INSTRUMENT [FB500]

Block interface

PLC programming

Project tree

Devices

- FESTO IO
- PLC IO
 - PLC AI Tags [14]
 - PLC AO Tags [5]
 - PLC DI Tags [18]
 - PLC DO Tags [22]
 - PLC Tags [2]
- PLC data types
- Watch and force tables
- Program info
- PLC alarms
- Text lists
- Local modules
 - 1EL993VF_PLC [CPU 315-2 ...]
 - DIGITAL INPUT SLOT 4
 - DIGITAL OUTPUT SLOT 5
 - ANALOG INPUT SLOT 6
 - ANALOG INPUT SLOT 7
 - ANALOG OUTPUT SLOT 8
- Distributed I/O
 - PROFINET IO-System (100): ...
 - DP-Mastersystem (1): 1EL9...
- EL101_PLC [CPU 317F-2 PN/DP]
 - Device configuration
 - Online & diagnostics
 - Program blocks
 - Add new block
 - Main [OB1]
 - System blocks
 - Technology objects
 - External source files
 - PLC tags
 - PLC data types
 - Watch and force tables
 - Program info
 - PLC alarms

Details view

Name	Details
IN_AIR_FLOW_FAULT	%I0.6
IN_BATTERY_CHARGING	%I0.4
IN_DRIP_TRAY_SWITCH	%I1.6
IN_DUAL_LOOP_OPERA...	%I1.2
IN_EMERGENCY_STOP	%I0.7
IN_FUSE_TRIP	%I0.0
IN_GAS_TRAP_SWITCH_C...	%I1.4
IN_GAS_TRAP_SWITCH	%I1.3

Network 10: LS956 high generated from LT959 Analog signal

Network 11: LS957 generated from LT959 Analog signal

Network 12: LS955

Network 13: LS956

24-Mar-20

The screenshot displays the SIMATIC Manager environment. The project tree on the left shows the hierarchy: Project tree > C2E MK2 VF KRAFT ET > 1EL993VF_PLC [CPU 315-2 PN/DP] > Program blocks > FB INSTRUMENT [FB500]. The main workspace shows a ladder logic network (Network 11) with the following logic:

```

Network 11: L5957 generated from LT959 Analog signal
Comment
|
|   %MD6                                     %M0.2
|   "LT959_Scaled"                           "LS957_from_
|   |                                         Analog"
|   |<=|-----|-----|
|   |Real|                                         |
|   |25.0|                                         |
|
|
|   %DB5957
|   "IDB LS957"
|
|   %FB514
|   "FB 2PS Level Switch Level Low"
|
|   EN-----|-----|-----| ENO
|
|   %DB101.DBX6.0
|   "DB System".
|   RESET_OUT.RESET_
|   ON-----|-----|-----| IN_RESET
|
|   %M0.2
|   "LS957_from_
|   Analog"-----|-----|-----| IN_LEVEL_
|                                     SWITCH
|
|   %DB101.DBX12.0
|   "DB System".
|   SIMULATION_OUT.
|   SIMULATION_ON-----|-----|-----| IN_SIMULATE
|
|   %DB822.DBX12.7
|
|
|   %DB501.
|   DBX598.0
|   "DB Instrument".
|   LS957_OUT-----|-----|-----| OUT
  
```

The details view at the bottom shows a table of variables:

Name	Details
IN_AIR_FLOW_FAULT	%I0.6
IN_BATTERY_CHARGING	%I0.4
IN_DRIP_TRAY_SWITCH	%I1.6

5. Remember to leave HV921 in always open position and remove HV907 if these valves are installed on the project
6. Run the system to verify good operation. Adjust parameters for high level, low level and operation level
7. Remember to take a backup of the tested software and send to HQ