Checked	Version	Release date
QA	V4.2.6 F1 – F2 EN	26.01.2012

Manual

FLOW CONTROLLER TYPE S/601

MODELS F1 AND F2

INTRODUCTION

Thank you for using the S/601 flow and batch control series.

This manual was prepared to provide instructions for the operation of the S/601 flow controller

We advise you to read this manual entirely before operating this instrument.

The 4 main parts of the manual are:

Part I : System Description; Overview of the working and operating principles.

Part II : Programming and Operating; Menu overview and function descriptions.

Part III : Alarm Messages.

Part IV : Appendix, technical details and connections.

INDEX

INTRODUCTION **2**

INDEX **3**

PART I. SYSTEM DESCRIPTION **4**

GENERAL FUNCTION DESCRIPTION 4
OPTIONAL DATA ACQUISITION 4

PART II. PROGRAMMING AND OPERATING **4**

MOUNTING AND CONNECTION 4
GENERAL 4
PROGRAMMING INSTRUCTIONS 5
Key functions *5*
Chart 1: Functional description *5*
Programming S/601 F1 and F2 ..... *6*
OPERATING INSTRUCTIONS 7
CLARIFICATION OF VARIOUS SETTINGS 7
EQUFLOW SENSOR CALIBRATION 8

PART III. ALARM MESSAGES **9**

ALARM AND ALARM MESSAGES 9
WHAT TO DO WITH AN ALARM 9
ALARM MESSAGES AND POSSIBLE CAUSES 9

PART IV. APPENDIX - TECHNICAL SPECIFICATIONS **10**

TECHNICAL SPECIFICATIONS 10
CONNECTION AT THE CIRCUIT BOARD 10
PRINT LAYOUT 11
CONNECTIONS DESK TOP MODEL S/601 CONTROLLER REAR SIDE 12
CAUTION 12
SWITCHING PUMP OR OTHER EQUIPMENT WITH HIGHER OR LOWER SUPPLY 12

PART I. SYSTEM DESCRIPTION

General Function description:

Depending on model F1 or F2, the following modes of operation are possible with the S/601 flow controller unit:

F1 version:
- Measuring 1 flow including totalizing passed volume.
- Monitoring flow process parameters like minimum and maximum flow rates.
- Controlling leak detection with programmable setpoints.
- Generating an internal or/and external alarm if a setpoint is exceeds.
- Datalogging (only if provided with a communication X-port).

F2 version:
- As F1 but for 2 channels.

Optional Data acquisition:

Dosage and totalized volumes are stored in the S/601 memory.
By adding an optional X-communication port, data can be exported to a network or PC and the S/601 unit will have its own IP address. The Standard S/601 is not equipped with an X-port connection.
This should be ordered together with the S/601 controller and is then built in at the factory.
Ask your supplier for extra information or send an email to info@equflow.com.

PART II. PROGRAMMING AND OPERATING

Mounting and connection

1. If possible, mount the controller in a dry and clean location. Avoid direct sunlight on the flow meter as it may affect the readings.
2. Check all electrical connections (see part IV of this manual). Power supply = 24VDC.
   Use the appropriate cable connections to connect flow meter to the S/601 flow controller. Cable connections all to be found in part IV page 12.

General

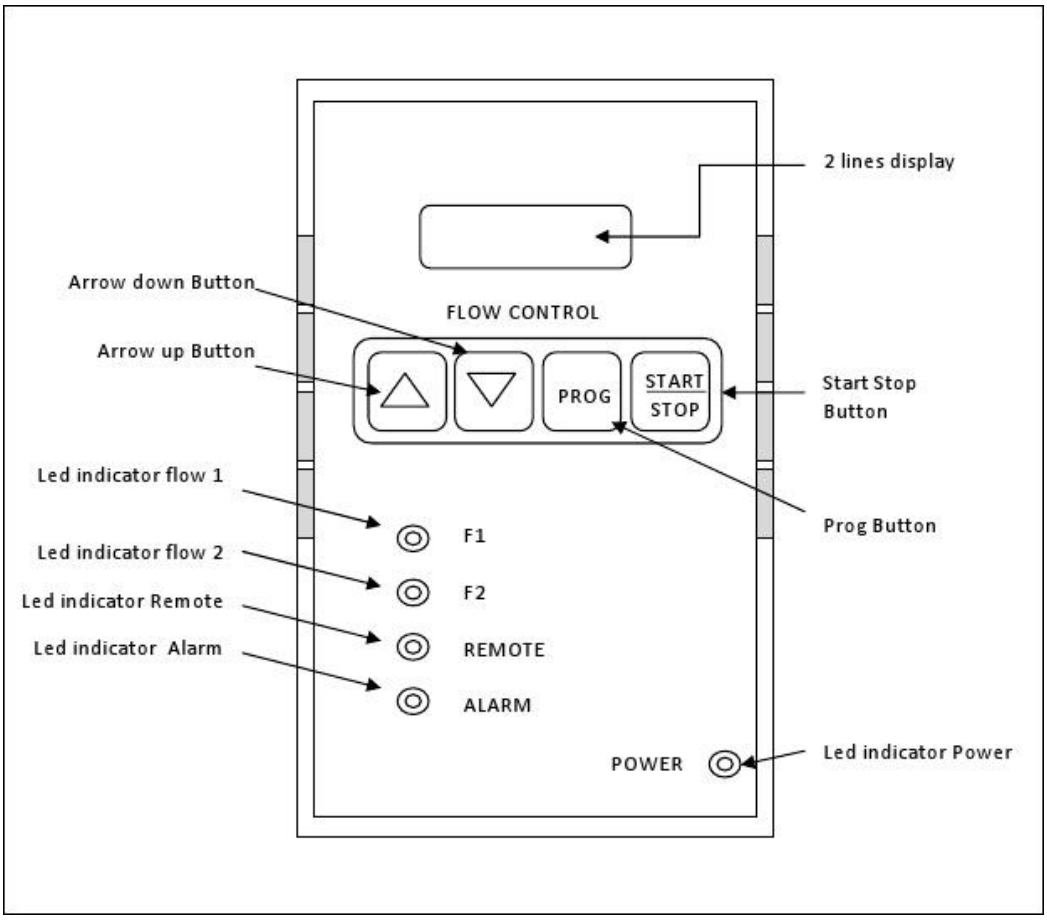
Because the S/601 flow controller can be used in multiple applications and modes of operation, the appropriate parameters (K-factor, display functions, alarm settings, etc.) must be programmed into the unit prior to use.

Programming instructions

Key functions

- To enter the programming mode press [PROG];
- Adjusting some higher level settings, a password must be supplied. Change values with the arrow keys and PROG to enter:
  Password 1(Machine operator mode) 0001
  Password 2(Technician mode) 0022
- To navigate the programming parameter tree,
  - UP/DOWN ARROWS: Navigate categories and parameters, change parameter values.
  - START/STOP: Goes back to the previous menu level.
  - PROG: Selects categories and parameters to change, saves values.
- To change parameter values
  - Navigate to (arrows) and select (PROG) parameter to change.
  - Cursor will blink when editing values. To change the value, use up/down arrow keys and press PROG to save digit.
  - After last digit is entered, pressing PROG will save parameter value and exit back to parameter description.
- Press START/STOP to exit back one level.

Chart 1: Functional description



Programming S/601 F1 and F2

F1 = 1 flow channel
F2 = 2 flow channels

How to program:

- Press [prog] to start programming or to make a selection.
- Use ↓ or ↑ to select the right number or to scroll through the menu.
- By pressing the [prog] button again, you step to the next digit.
- Always press the [prog] button to leave settings after making an adjustment in PIN mode. In order to protect your adjustments.

PIN codes:

0001 = access to Machine Operator mode
0022 = access to Technician mode

Nbr	Level/settings	Press [PROG] and:
	Operator mode	
1	Totals flow 1	Read display
2	Calibrate sensor 1	Follow instructions
3	Totals flow 2	Read display
4	Calibrate sensor 2	Follow instructions
5	Login with Pin	0001 for Mach. Operator or 0022 for Technician level
	Machine Operator mode	
7	Units flow 1	Select unit
8	Time units flow 1	Select unit
9	Decimals flow 1	Select unit
10	Alarm delay 1	Select in seconds
11	Units flow 2	Select unit
12	Time units flow 2	Select unit
13	Decimals flow 2	Select unit
14	Alarm delay 2	Select in seconds
15	Firmware version	Read display
16	Logout user	Logout
	Technician mode	
17	Units flow 1	Select unit
18	Time units flow 1	Select unit
19	Decimals flow 1	Select unit
20	Alarm delay 1	Select in seconds
21	Max flow 1 alarm level	Adjust setting
22	Min flow 1 alarm level	Adjust setting
23	K factor sensor 1	Adjust K factor
24	Units flow 2	Select unit
25	Time units flow 2	Select unit
26	Decimals flow 2	Select unit
27	Alarm delay 2	Select in seconds
28	Max flow 2	Adjust setting
29	Min flow 2	Adjust setting
30	K factor sensor 2	Adjust K factor
31	Language	Select language
32	Firmware version	Read display
33	Logout user	Logout

Operating instructions

- Wiring is connected, checked and ok.
- Power supply is connected.

Switch on the power supply of the 601 controller.

In [Stand By] mode
Controller checks 1 or 2 flow channels.
Flow will be detected and totalizing occurs.
Display shows:
In F1 mode; actual flow F1 and totals flow T1.
In F2 mode; actual flow F1 actual flow F2.
No alarm will be provided.
Alarm LED shines green.
Power LED shines green.
F1 and F2 LEDs are not shining.

In [Start] mode
By pushing the [start-stop] button, alarm mode will be activated.
Controller checks 1 or 2 flow channels.
Flow will be detected and totalizing occurs.
Display shows:
In F1 mode; actual flow F1 and totals flow T1.
In F2 mode; actual flow F1 and actual flow F2.
Alarm is switched on and activated if an alarm setting is exceeded.
Alarm LED shines green when there is no alarm, and red if an alarm is detected.
Power LED shines green.
F1 and F2 LEDs shines green.

By pushing the [start-stop] button again, the 601 controller will return to [stand-by] mode.

Clarification of various settings

Function	Description	Remarks
Password		Password 1 (Machine operator) : 0001 Password 2 (Technician) : 0022
Settings flow	Settings for sensor 1 or 2	
Totals flow	Total amount of starts and the total amount of liquid per channel	**To Zero the values press arrow up and then prog.**
Units flow	Units shown in the display.	Millilitre, Liter, Cubic-meter, US Gallon, UK Gallon, Fluid once, Gram, Kilogram, Tone, Pound
Decimals flow	Decimals selection for a higher resolution	
Time units flow	Display value time units	sec., min., hour
Flow rate	Set point of the required flow rate	
Calibration	Display will show the last measurement enter the right amount and confirm with prog	Last measurement of the dosing or the last flow measurement between start and stop
K factor units	Unit selection for the K factor (pulse/units) standard at pulses/liter	Millilitre, Liter, Cubic-meter, US Gallon, UK Gallon, Fluid once, Gram, Kilogram,Tone, Pound
K factor of the sensor	The amount of pulses per liter	1 till 999.999
Alarm delay	Alarm delay time	0,1 till 999,9 sec

Function	Description	Remarks
	After the controller is started it expects a flow. In the case it doesn't measure a flow it will trigger the alarm output after the delay time that has been set.	**This setting is only used in batching mode** **Main and batch F1 always 0 sec** **Flow monitoring F2 always 0 sec**
Max flow	Maximum flowrate setpoint for an alarm, triggering output 4	
Min flow	Minimum flowrate setpoint for an alarm, triggering output 4	
Pincode settings		
Pincode Operator	Standard 0001	
Pincode Technician	Standard 0022	
Sundries		
Firmware version	Equflow S601FLOW Version 4.7.2	
Display settings		
Language	English or Dutch	Others on request

Equflow sensor calibration

Make sure that the K-factor is already set to the default according to Equflow model:
0045 110000 pulse/L
0085 6100 pulse/L
0125 2000 pulse/L

For **Flow mode** applications follow the following steps to calibrate your flow meter:

1. Press start and then start the pump to capture a volume of liquid to be measured[1].
2. Stop the pump and then press stop on the controller.
3. Measure the volume of the liquid collected.
4. Enter programming mode, log in if necessary, and navigate to Cal. Sensor 1 or 2. Select with prog.
5. The display will show the amount of the last dosing. If the volume does not match the measured volume, then change the amount and confirm by pressing [prog]. The K-factor will be automatically changed.
6. Exit programming mode by pressing stop until you reach the idle screen.

[1] Calibration liquid should be the same liquid intended for use. If this is not possible, a model solution with identical density and viscosity should be used.

PART III. ALARM MESSAGES

Alarm and Alarm messages

The controller will take the following actions during an alarm:

1 Display text will show the alarm message.
2 The red alarm-led F1 or F2 will light.
3 The system buzzer will beep.
4 The alarm output [4] will trigger (NPN).

An alarm will only be generated if the controller is in start mode by pushing [Start].
An alarm will be turned off if the value programmed is 0 (zero).

What to do with an alarm

1 Write down the text displayed.
2 Press Stop button to release alarm.
3 Solve the problem.

Alarm messages and possible causes

Alarm messages		
Alarm Text:	**Possible cause:**	**Solution:**
Min or max flow	The controller is expecting a flow but does not measure one; or The flow is too high (max flow); or The flow is too low (min flow); • Valve does not open, pump start • Sensor gives no signal • Pump not running (Air pressure?) • Tank empty • Filter blocked?	Depends on what caused the alarm. Solve problem depending alarm cause.
Extern alarm	Controller received a stop command from the external input.	Solve external issue.

PART IV. APPENDIX – TECHNICAL SPECIFICATIONS

Technical specifications

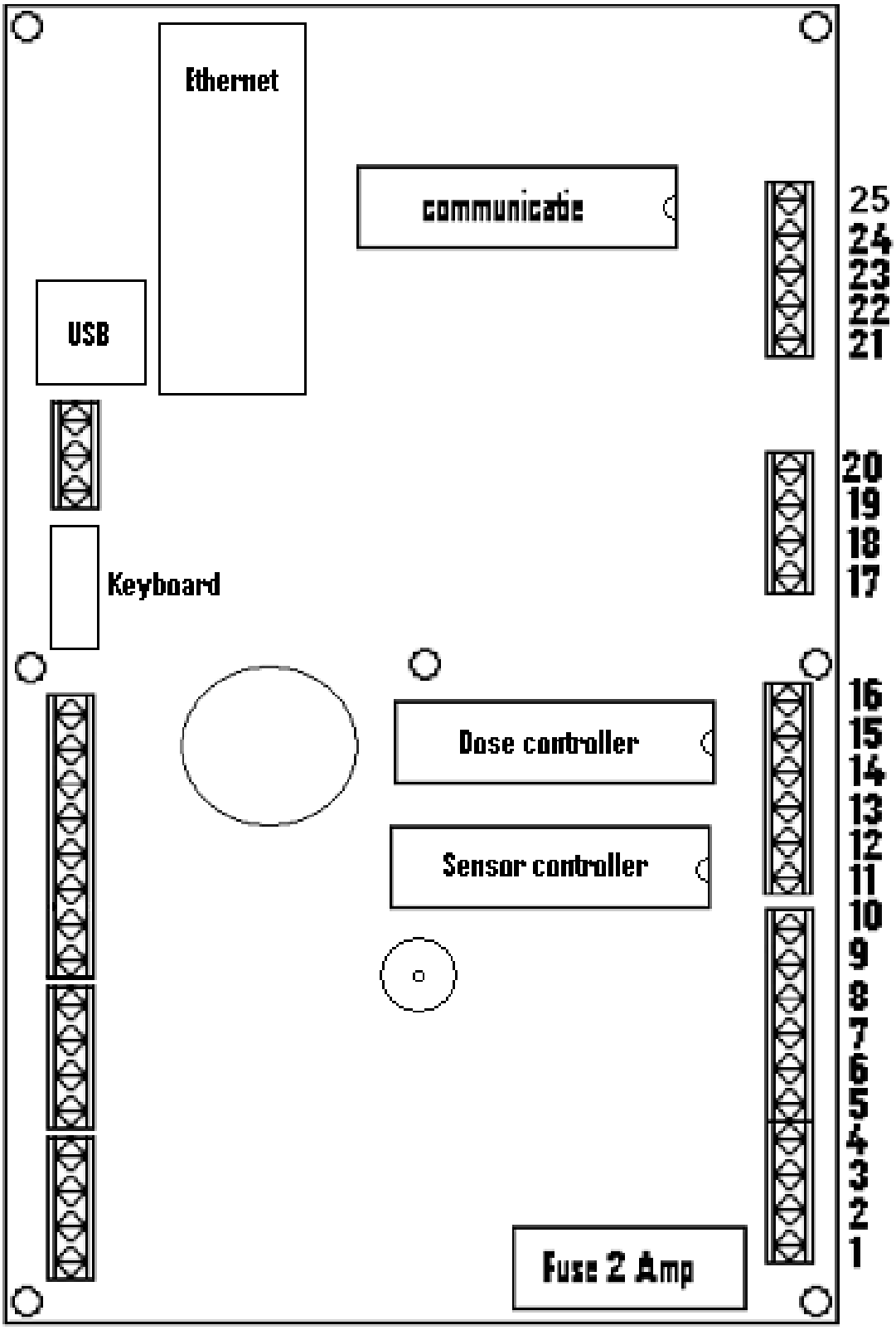
Supply	:	24 VDC
Power consumption	:	ca 200 mA
Fuse	:	F 2 Amp at pcb
Max. pulse freq.	:	6000 Hz
Display	:	2 lines / 16 digits
Ambient temp.	:	-10 - +60 C°
Dimensions encl.	:	130 x 115 x 180 (Br x H x D)
Waterproof	:	IP65

Connection at the circuit board

Nr.	Connection:	Remark:
1	Zero 24 VDC	Supply
2	+ 24 VDC	Supply
3	Zero 24 VDC	
4	+ 24 VDC	
5	Sensor +	Flow sensor 2
6	Sensor pulse	Flow sensor 2
7	Sensor -	Flow sensor 2
8	Sensor +	Flow sensor 1
9	Sensor pulse	Flow sensor 1
10	Sensor -	Flow sensor 1
11	Plus 24 volt DC	
12	External input 4 connect to +24 volt	Reserve
13	External input 3 connect to +24 volt	Stop flow 1 and 2
14	External input 2 connect to +24 volt	Start flow 2
15	External input 1 connect to +24 volt	Start flow 1
16	Zero of 24 VDC	**Pen 17 WM pin 6 9pole Sub D**
17	Spare/Output	
18	Spare	
19	Spare	
20	Spare (if equipped start signal for WM pumps + 5 volt)	**Pen 7 WM pin 1 9pole Sub D**
21	Output 4 (switching to zero volt) **Attention 24 DC**	Alarm output
22	Output 3 (switching to zero volt)	Reject pulse max or min over dose
23	Output 2 (switching to zero volt)	Valve and or pump start 2
24	Output 1 (switching to zero volt)	Valve and or pump start 1
25	+ 24 VDC	

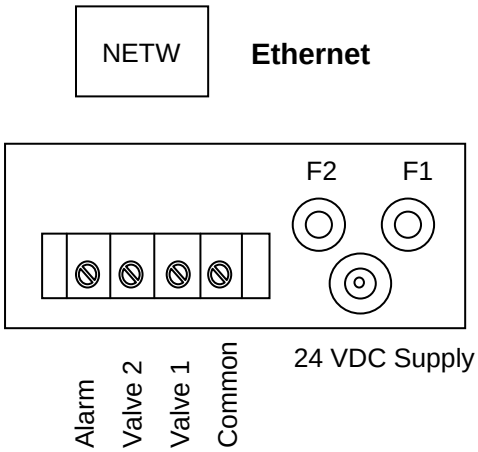
Switching 110 or 220 AC use extra relays

Print layout

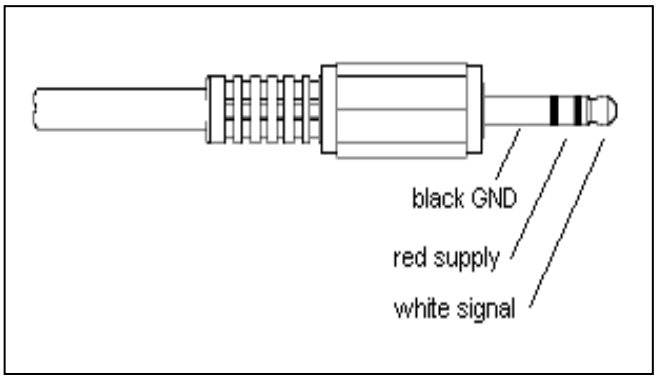


Connections Desk top model S/601 controller rear side:

Network connection Ethernet



F1 = flow meter 1, 3,5 mm stereo jack
F2 = flow meter 2, 3,5 mm stereo jack



Attention:
Sensor with **grey cable** and metal plug Red supply and white signal

Sensors with **black cable** and rubber plug white supply and Red signal Drain wire ground

Caution

Always check wiring instructions provided with the 601 controller.
Changes may occur without notice.

Switching pump or other equipment with higher or lower supply

Contact us for specific details.