FT LASERLINE Series

TECHNICAL DATA SHEET

Weller FT
FILTER SYSTEMS

For a better workbench environment!

Content

LASERLINE 450

LASERLINE 250

LASERLINE 150

Laserline series is a wide range of filter systems designed to eliminate hazardous gases and particles from applications like marking, cutting, engraving, welding and barcoding.
Laserline 250 and Laserline 450 can be equipped with special filters depending on application.

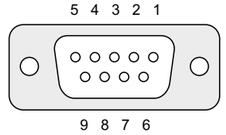
- **High effective 3-stage filter**
- **Very low sound level**
- **Low cost of ownership**
- **Interface for fully integrated control**
- **Minimal need of service**
- **Filter service indicator**

Technical data	LL 150	LL 250	LL 450
Max suction capacity, m3/h (CMF)	100 (58,8)	250 (147)	400 (235)
Blower capacity, m3/h (CMF)	140 (82,3)	310 (182)	645 (380)
Sound level, dB(A) at 1 m	< 44	< 50	< 50
HEPA class micro filter, separation degree MPPS, %	> 99,98	> 99,98	> 99,98
Gas filter - chemisorbtion - separation degree, %	> 99,98	> 99,98	> 99,98
Pre filter bag quality	F8	F8	F8
Power, W	100	300	300
Voltage, V	115/240	115 or 230	115 or 230
Height, mm (in)	680 (26,4)	1016 (40)	1016 (40)
Width, mm (in)	340 (13,4)	400 (15,7)	796 (31,3)
Depth, mm (in)	340 (13,4)	402 (15,9)	402 (15,9)
Weight, kg (lb)	18 (39,6)	43 (94,8)	68 (150)
Warranty, except for filters, years	2	2	2

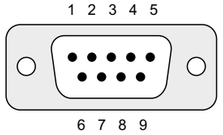
2. Connectors

The filter systems are equipped with a D-sub connector, size E with 9-connectors (DE-9).
The filter systems are equipped with the female part.

DE-9 female connector (on the filter system)



DE-9 male connector (on the cable)



Description

1.	Available for options	6.	Rx (Receive)
2.	DC 24V on LL250/LL450 (DC 36V on LL150)	7.	C
3.	Ground (GND)	8.	Pre filter alarm NO (Normally open)
4.	Available for options	9.	Micro filter alarm NO (Normally open)
5.	Tx (Transmit)		

3. Control system

Laserline interface is capable of the following:

Speed settings with 5 % increments from 0-100 %

Start/stop function The laser can control the fume extractor when the Rx (6) to GND (3) circuit is open and stop fume extractor after 3 sec when this circuit is closed.

External power devices The connector can support external devices with power (2). (36VDC for LL150 and 24VDC for LL250 and LL450).

Safe extraction The interface can send information "Filter system running" to the laser, to start the laser.This to be sure that the filter system is on and functional when the laser starts. For added functionality a pressure drop switch could be connected to the filter system (see chapter 7).

Filter service indication

- Pre filter and Hepa system
A lowest airflow could be set and send an audible alarm signal through the protocol.
- Gas filter
Monitoring the gas filter is achieved by measuring the gas filters operating time.

4. Options

4.1 Automatic flow control
Automatic adjustments of the air speed through the filter. Increases the life time of the filters.
Control system that has a pressure sensor in the inlet, before the pre filter. Keeps the airflow constant as long as the inlet pressure (vacuum) is constant.
Another pressure sensor is placed between the main filter and the blower.The pressure drop between the two sensors will indicate the amount of dust cought.

To high pressure drop → Alarm starts, time for filter change

4.2 FT Communication system
Interface for communication to the filter system via interface RS232.
The communication system is an easy tool to use for controlling the filter system and it gives an overview of the filter systems functions.
The system is very easy to use, just install the software and then the filter system is controllable.

4.3 Remote control
Remote control for easier controlling of the filter system.

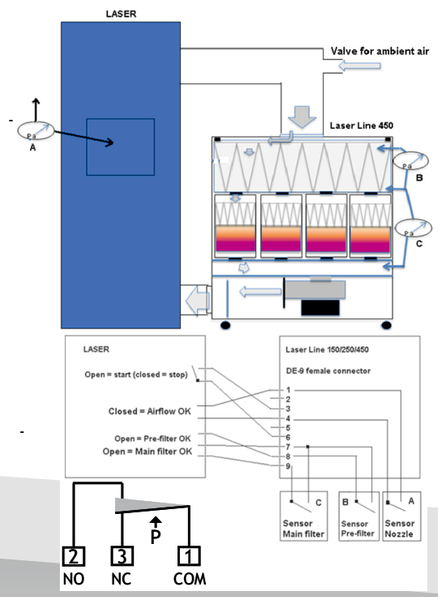
5. Installation example

The air is sucked through a nozzle inside the laser, an pressure drop switch (A) is attached to monitor. The pressure difference between nozzle and ambient air, as this gives a good measurement of the airflow. Ambient air measured inside the laser box gives a more correct value, but the difference should be small when compared to ambient air outside the box.

Laser Line 450 has been equipped with a pressure drop switch (B) to monitor the pressure difference before and after the pre filter, as high pressure will give a signal to change pre filter. Additionally a pressure drop switch is attached (C) to monitor the pressure difference before and after the main filter, as high pressure will give a signal to change main filter.

The A, B & C sensors can be adjusted between 30 – 300 Pascal. One cable is connected to COM (Common) and the other cable is connected to NO (Normally open) to give a signal to the laser. When the pressure difference increases the connection COM & NC will change to COM & NO.

We also add the Start/Stop interface, so the laser can open the connection between pin 3 & 6 to start the Laser Line 150/250/450 unit. The laser can then wait until "Airflow OK" sensor is closed, before starting to use the laser.The laser can continue to work as long as "Airflow OK". The sensors for "Pre-filter OK" and "Main filter OK" are only a signal to prepare maintenance.
Wiring of interface between the laser and the Laser Line 150/250/450 unit.



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6. Communication protocol

Serial communication 1 and 0 sent at a rate of 1200 baud (symbols per second).The remote control or other external unit will send 3 bytes of information in the Rx-cable, when the button is pressed or information need to be sent. At the start of each second the filter system will send 17 bytes of information in theTx-cable and then pause until the start of next second.
Each byte is based on 8 bytes (1 or 0) and it is equal to 2 hexadecimal symbols (2 x 4 bits).

Hexadecimals
Hexadecimals (Hex) uses symbols 0-9 for values zero to nine, and A, B, C, D, E, F for values ten to fifteen.The lowest value of a byte is thus 00 and the highest value is FF. In normal "10 base" this represents 0 and 255.Two bytes combined can thus represent 256 x 256 = 65 536 numbers between 0 - 65 536.

Information received (Rx) from external unit to filter system

BYTE	NAME	NOTE	EXAMPLE PROTOCOL	EXAMPLE VALUE
No.1	Start transmission		FE	Always FE
No.2	Button (TG 1 to 4*)	TG1=1,TG2=2,TG3=4,TG4=8 05	TG1+TG3 Active	
No.3	Check sum = Data Byte No.2		05	Same as above

*TG1 = Increase,TG2 = Decrease, TG3 = Filter monitoring,TG4 = Start/stop

Information transmitted (Tx) from filter system to external unit

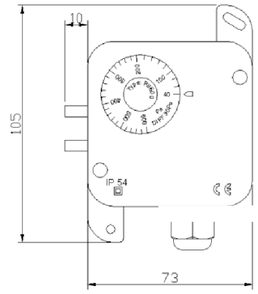
BYTE	NAME	NOTE	EXAMPLE P.	EXAMPLE V.
No.1	Start transmission		FC	Always FC
No.2	Remaining filter time (High byte)	03FA = 0+(16x16x3)+(16x15)+10 = 1018	03	1018 hours
No.3	Remaining filter time (Low byte)		FA	
No.4	PWM = Power to blower	17 = 16+7 =23 (0-99, 0=off)	17	23 %
No.5	Blower speed (Low byte)	00F2 = 0+0+(16x15)+2 = 242	F2	Speed 242
No.6	Blower speed (High byte) 00			
No.7	Alarm (triggered by blower speed)	0=off, 1=alarm on without alarm,	02	Alarm ON 2= alarm
No.8	Version software (Low byte)	B59A = (16x16x16x11) + (16x16x5) (16x9) + 10 = 46490	+ 9A	Version 46490
No.9	Version software (High byte)		B5	
No.10	Total operating time (Low byte)	05D7 = 0+(16x16x5)+(16x13)+7=1495	D7	1495 hours
No.11	Total operating time (High byte)		05	
No.12	Filter time monitoring (6 x 500 hours)	Value = 0 - 5	02	3 x 500 hours
No.13	(Not in use)	Value = 0	00	0
No.14	(Not in use)	Value = 0	00	0
No.15	(Not in use)	Value = 0	00	0
No.16	(Not in use)	Value = 0	00	0
No. 17	(Check sum) Only (Low byte)	Sum of Byte 2 – 16 gives 2 byte number. Only (Low byte) sent	78	Check sum

7. External eqipment

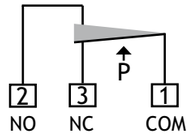
For special demands or applications a number of external sensors can be used.

7.1 Pressure drop switch

A pressure drop switch measures pressure difference.



Connect the two plastic tubes on the left side to points where you like to measure. When differential pressure increases, the contact 1 - 3 will open and contact 1-2 will close.



7.2 Sensor for pressure of air blowing out
An electromechanical differential vacuum switch can be used to measure the pressure difference between surrounding air and the pressurized air blowing out. Calibrate this switch to give a signal when the pressure (airflow) is correct. Use pin 1 & 4 in the connector for this circuit or one of these pins and the ground GND to send this signal to the laser.

7.3 Temperature sensor
Use a temperature sensor in the inlet of the machine to make sure that the air is not too warm.You can use pin 1 & 4 in the connector for this circuit, or use one of these pins and the ground GND to send this signal to the laser.

7.4 Humidity sensor
Use a humidity sensor in the inlet of the machine to make sure that the air is not too humid.You can use pin 1 & 4 in the connector for this circuit, or use one of these pins and the ground GND to send this signal to the laser.

7.5 Spark & fire protection
Laser fumes with sparks and flammable material can cause a fire. It is therefore important to make the installation as safe as possible.

1. Use standard ventilation pipes (metal) to create a distance to the fume extraction unit. A Laser Line 450 can be connected with up to 20 meter ventilation pipe (diameter 160 mm) and this distance will give the sparks time to cool down.
2. Make sure to clean the ventilation pipes often to make sure that large amounts of flammable material is not inside these pipes.
3. A spark trap can be placed in the beginning of the pipe.This spark trap can be made of metal plates or metal mesh.
4. A fire trap can be created with a valve that closes if the temperature rises in the pipe.This will cut off the air flow and the Laser Line 450 unit will then automatically stop.

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