



FR-300-Plus Auto-Brushing Flow Reservoir for Pyxis Lab[®] Sensors

Product Description

The Pyxis FR-300-PLUS is a magnetic coupling motorized brush flow assembly that provides an inline mechanical cleaning of the ST-765SS Series bare gold electrode enabling sensor accuracy in challenging industrial cooling and process waters. This unique device enhances the convective mass transport of the oxidizer or reducing agent analyte to the sensor electrode surface eliminating the need for precision flow control commonly required for other amperometric sensors on the market. The FR-300-PLUS also provides supplemental deactivation protection of the bare gold electrode for long life, stability, and precision accuracy in extremely challenging waters. The FR-300-PLUS is also designed to be utilized with a wide variety of alternative Pyxis inline sensors for a broad range of measurement. These additional sensors are outline in this document.

The FR-300-PLUS contains a 'chemical injection port' in the assembly housing allowing for the optional injection of cleaning agents at the brush head for extremely challenged industrial waters containing fats, oils and grease. This port may also be used for the addition of Potassium Iodide for measurement of "True Total Chlorine". The FR-300-PLUS may be operated at a broad range of regulated sample flow from 200 and 800mL per minute with an inlet pressure of <30 psi. The FR-300-PLUS outlet flow line should be diverted to drain or returned to an atmospheric tank/sump within the process itself for reuse.

The FR-300-PLUS comes equipped with a magnetically coupled brush mounted in the liquid end of the flow reservoir. Operational life of the brush is typically 1+ year of service however this is application dependent based on water quality. The brush is held in place via magnetic coupling to the motor shaft for rapid tool-free removal and replacement. Brush replacement is outlined in the later sections of this document.

The FR-300-PLUS requires 24VDC power supply at approximately 2.5watts and can be directly connected to the OEM controller or may be powered by the optional Pyxis Lab outlet power supply adapter accessories available for both 110VAC and 230VAC outlet operation. (Purchased separately) Pyxis Lab has developed a wide variety of pre-assembled analyzer panels incorporating the proprietary ST-765SS series sensor in combination with FR-300-PLUS self-brushing flow assembly and the UC-Series of Pyxis display and data logging terminals. Alternatively, the ST-765SS Series sensors and FR-300-PLUS self-brushing flow assembly may be utilized with OEM controllers, PLC's and DCS networks to providing a higher level of control for system chemistry applications while incorporating the unique Pyxis bare-gold sensor technology.

Specifications

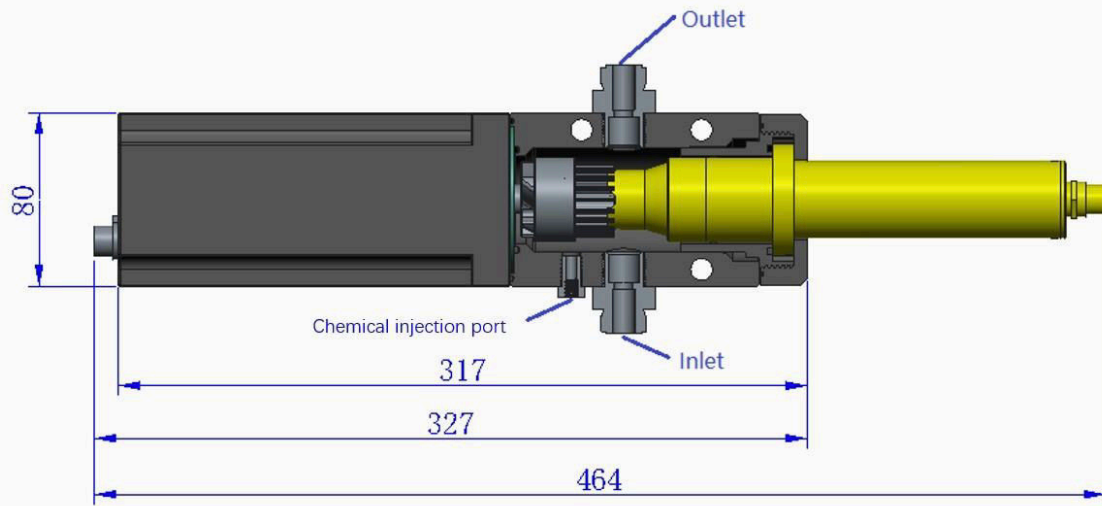
Item	FR-300-Plus Flow Reservoir
P/N	50700-A44
Description	Auto-Brushing Single Flow-Reservoir Assembly for Pyxis Lab, Inc. Sensor Platforms
Power Supply	24V DC, ≤5W [Includes (1) Flying Lead Cable & (1) PowerPack Connection Cable]
Storage Temp.	-7–60 °C (20–140 °F)
Control Method	RS-485 or Powered Relay
Dimension	12.48in (317mm) L, 3.15in (80mm) Body Square
Body Material	UPVC
Weight	2600g (5.732lbs)
Operating Temp.	4–40 °C (40–104 °F)
Sample Inlet Pressure	7.25–30psi (0.05–0.2MPa)
MIN Speed	100RPM
MAX Speed	400RPM
Sample Inlet/Outlet	3/8in - OD
Suggested Flow Rate	200–800mL/min (Consistent Flow Rate REQUIRED)
Wet Material	UPVC, ABS and 316 Stainless Steel
Cable Length	1ft Terminated with IP67 Adapter + 4.9ft Flying Lead with IP67 Adapters

Compatible Pyxis Lab, Inc. Sensors

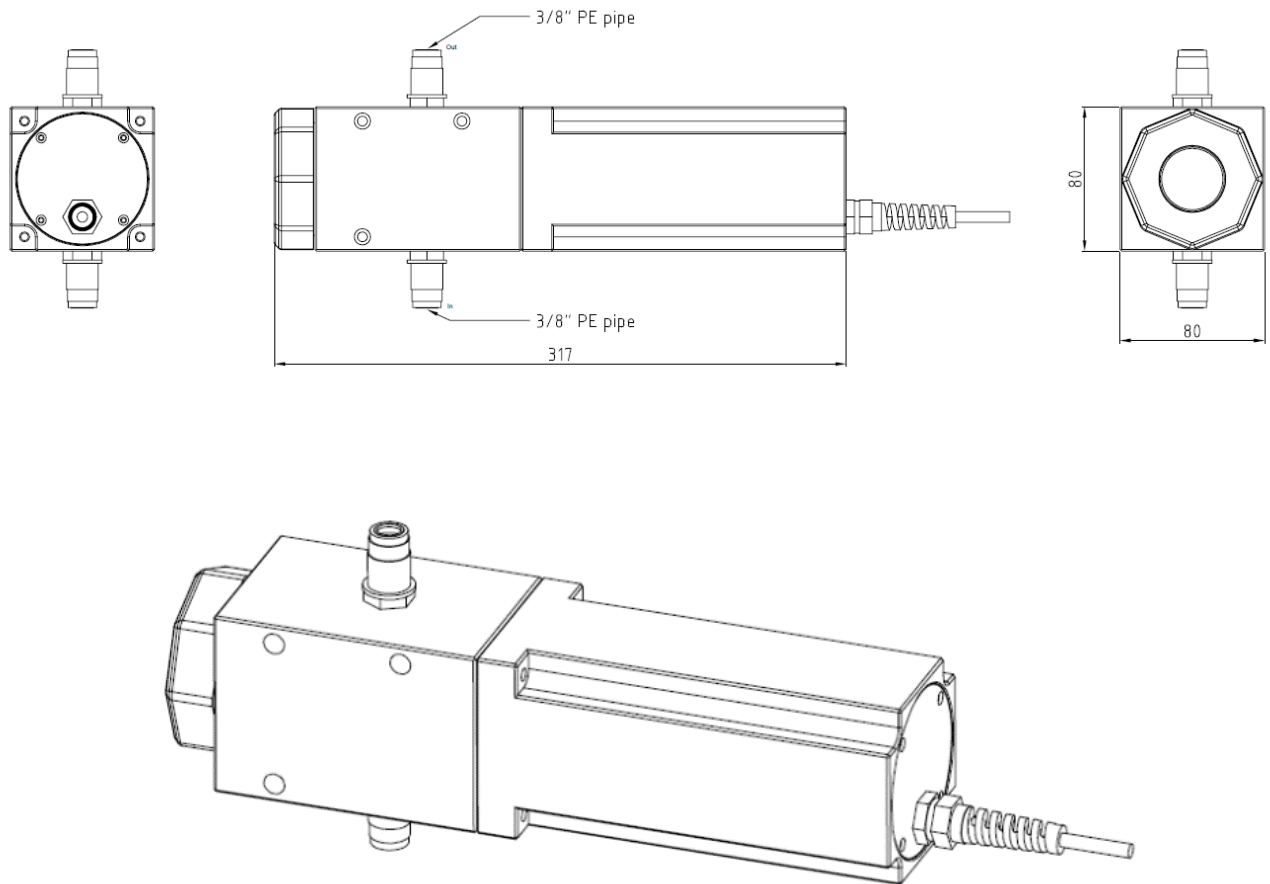
A wide variety of inline Pyxis sensors are specifically ideal for use with the FR-300-PLUS covering a broad range of measurement capability in dirty and challenged waters where previous sensor accuracy and maintenance was an issue. Please refer to current sensors below:

Item	Measurement	Part Number
ST-765SS-FCL	Free Chlorine + pH + Temperature	53607-NFR
ST-765SS-CLO	Chlorine Dioxide + pH + Temperature	53608-NFR
ST-765SS-Br	Bromine + pH + Temperature	59643
ST-765SS-O3	Ozone + pH + Temperature	53614
ST-765SS-SO3	Sulfite + pH + Temperature	53624
ST-765SS-DCL	Free Chlorine + Sulfite + pH + Temperature	58444
ST-772T	Dissolved Oxygen (Stainless Steel)	53719
ST-772T-P	Dissolved Oxygen (CPVC)	53721
ST-710	pH (CPVC)	53001
ST-711	ORP (CPVC)	53002
ST-712	pH + ORP (CPVC)	53003
ST-710SS	pH (Stainless Steel)	53030
ST-711SS	ORP (Stainless Steel)	53031
ST-712SS	pH + ORP (Stainless Steel)	53032
ST-720	Conductivity/TDS	53101
ST-726	Conductivity/TDS	53114

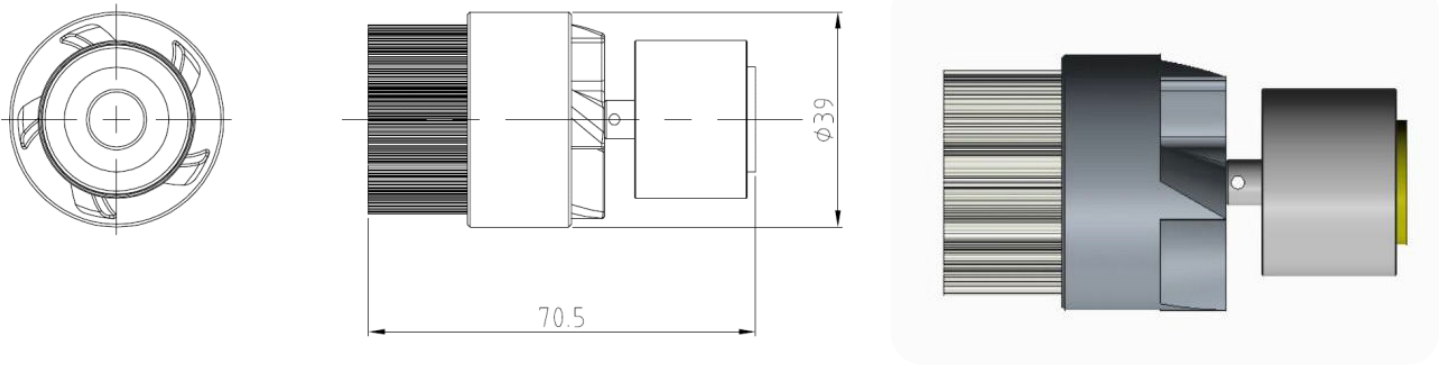
Component Schematic



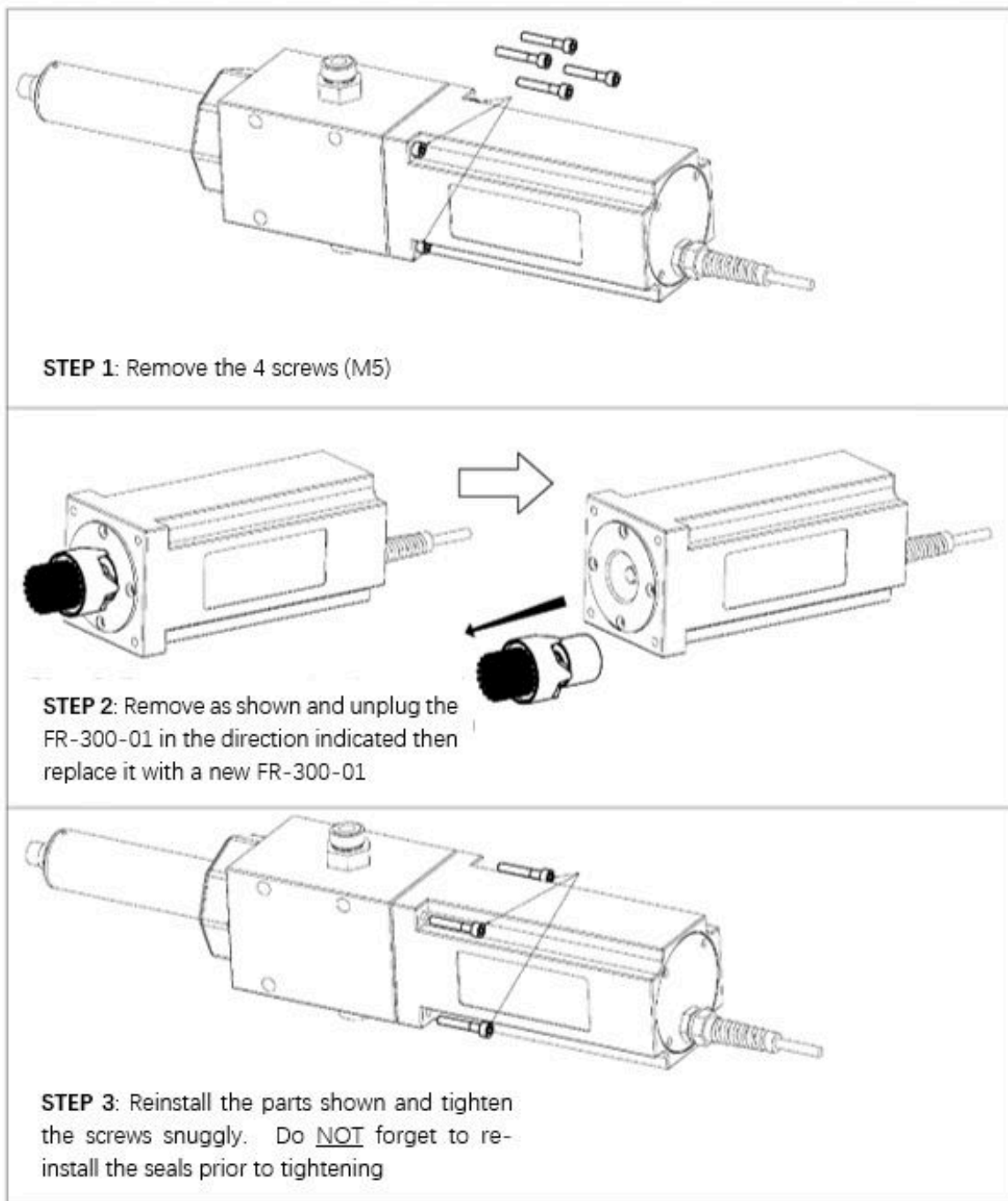
FR-300-Plus Dimensions (mm)



Replacement Brush Dimensions (mm)



Replacement Brush Assembly Procedure



FR-300-Plus Installation and Start-Up

Mounting: The FR-300-PLUS must be securely mounted to a back panel through the three (3) pre-drilled screw mounting holes in the reservoir body, with the Pyxis sensor aligned in a horizontal format as seen in the figure below. ***NOTE*** Sensor may be aligned to the left or right as desired.

Controller/PLC Provided Power Supply & Operation Mode: The FR-300-PLUS is a stand-alone unit and requires 24VDC power supply to operate. Operating 100% of the time or on a system operational flow basis is the Pyxis recommended mode of operation. This can be done via the connected controller as a powered relay activating the FR-300-PLUS on a system flow switch relay or with a constant 24VDC power supply. Each FR-300-PLUS will be shipped with both a flying lead cable (CE-FE-4.9) and PowerPACK connection cable (CE-ME-FE-2.0) as a standard. User can choose which cable they desire to use based on need.

Outlet Provided Power Supply & Operation Mode: For applications that require outlet provided power supply to the FR-300-PLUS, Pyxis offers MA-AC-7US (P/N 26398) and MA-AC-7EU (P/N 28787) power supply adapters in both 110VAC-USA (Type A) and 230VAC-EU (Type DIN) formats as optional accessories. These accessories allow the FR-300-PLUS to be outlet powered and operational 100% of the time. See order information section of this document for details.

RS-485 Communication: The FR-300-PLUS offers RS-485 connectivity which allows for rotational brush speed, operation, and duration for those desiring precision control. Contact Pyxis for RS-485 details.

Inlet/Outlet Flow: When mounted horizontally the inlet water flow to the FR-300-PLUS should enter the bottom of the unit via inlet port (3/8-inch OD) as seen in image above. The outlet water flow should exit the top of the unit via the outlet port (3/8-inch OD). The inlet water pressure should not exceed 30 psi. The outlet water should be returned to an open sump at atmospheric pressure and prevent siphoning with valve if necessary. The range of flow through the FR-300-PLUS should be consistently regulated between 200 and 800mL/minute. An inlet rotameter may be installed to verify and regulate inlet flow however, this is not absolutely necessary and a manual flow verification test is sufficient as long as flow remains consistently regulated. ***NOTE*** The FR-300-PLUS should be installed in a way to ensure the ST-765 series sensor remains flooded and wet regardless of flow condition. Pyxis recommends the 24VDC power supply to the ST-765 series sensor be turned OFF for systems that experience extended periods of stagnant water conditions.

Calibration: Once flow has been established and regulated, an in-situ slope calibration of the sensor can should be conducted using field analysis of the sample being measured. (ie. DPD Free Chlorine) See ST-765SS Series Operation Manual for detailed calibration instructions.



Wiring Instructions

Follow the wiring table below to connect the FR-300-PLUS to a controller or the Pyxis UC-50 via 24VDC and RS-485 modbus. Alternatively, any OEM controllers capable of providing 24VDC power supply may also be used. The FR-300-PLUS may be operated 100% of the time with no issue, simply by providing the unit 24VDC power supply. Some users may also consider operating the FR-300-PLUS as desired in an ON/OFF relay format based on their application needs. Each FR-300-PLUS will be shipped with one flying lead cable (CE-FE-4.9) for direct wiring to terminal and one PowerPACK connection cable (CE-ME-FE-2.0) for direct adapter connection to Pyxis PowerPACK Series for power supply. NOTE – The FR-300-PLUS may also be operated via 110VAC or 230VAC outlet power supply by utilizing optional Pyxis power supply adapter cables with plug purchased separately. See the ORDER DETAILS section of this document for details.

Pin Number	Wire Color	Designation
1	Red	24V
2	Black	0V
3	Blue	485A
5	Yellow	485B
7	Silver	Ground
4	White	N/A
6	Green	N/A

Modbus Communication Settings

Modbus Settings	
Baudrate	9600bps
Databit	8-bit
Stopbit	1-bit
Parity Check	Even
Bus Type	RS-485

Modbus Protocol

Modbus RTU Protocol	
Register Address Model	PLC Address Base 1
Byte Order	CDAB Little Endian Byte Swap
Supported Function Code	
03	Read Holding Register
06	Write Single Register
16	Write Multiple Registers

Register Address	Read	Write	Type of Data	Description
42001	0x03	0x06	16bit Unsigned Integer	Mailing Address, Range: 1-250; Default 200
42002	0x03	---	16bit Unsigned Integer	Communication Data Bits
42003	0x03	0x06	16bit Unsigned Integer	Comm. Parity, 0; No Parity, 1; Even Parity, 2; Odd Parity
42004	0x03	---	32bit Unsigned Integer	Communication Baud Rate
48001	0x03	0x06	16bit Unsigned Integer	Start/Stop, 1 is Start, 0 is Stop
48002	0x03	---	16bit Unsigned Integer	Reserve
48003	0x03	---	16bit Unsigned Integer	Real-time Speed, unit "RPM"
48004	0x03	0x06	16bit Unsigned Integer	Target Speed, unit "RPM" Range 100-400
48013	0x03	---	16bit Unsigned Integer	Alarm Flag, 0 = No Alarm, Others = Alarm
48014	0x03	0x06	16bit Unsigned Integer	Alarm Timeout, Real Speed \neq Target, 1-600sec
48017	0x03	0x06	16bit Unsigned Integer	Mode Selection, 0 = Open/Closed, 1 = Timing Mode
48018	0x03	0x06	16bit Unsigned Integer	Enable Time in Timing Mode, 1-30000sec
48019	0x03	0x06	16bit Unsigned Integer	Deactivation in Timing Mode, 1-30000min

Order Information

Part Number

FR-300 Plus Flow Reservoir

50700-A44

FRP-300-01 Replacement Brush Head for Flow Reservoir

50700-A49

CE-FE-4.9 Replacement 1.5m Flying Lead Cable

50762

CE-ME-FE-2.0 Replacement PowerPACK Cable

15526

MA-AC-7US Power Adapter for USA Type A Plug

26398

MA-AC-7EU Power Adapter for EU Type DIN Plug

28787