

Pump Equipment Line

Microfluidic

Automation & System

Lab-on-A-chip System Package



Plug & Play Instruments

OB1 Mk3 Microfluidic Flow Controller

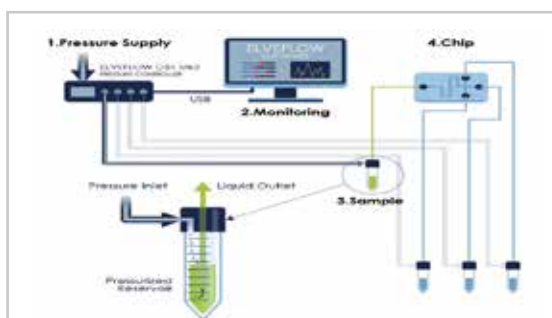


Microfluidics 최선의 선택

Pressure & Vacuum Dual Control

Air Pressure를 이용한 맥동없는 액체이송

20 times more stable & up to 10 times faster



구성품

- OB1 Mk3
- Software (Elveflow Smart Interface)

Option

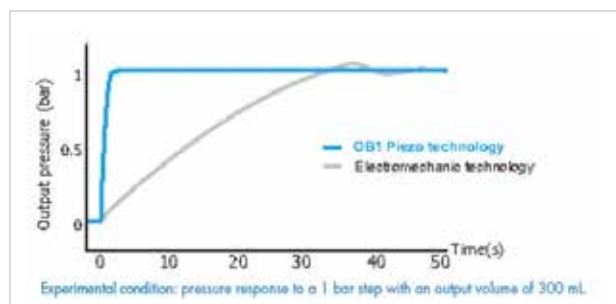
- Connection Kit
- Kits
- Reservoirs
- Flow Sensor
- Compressor

제품 상세 설명

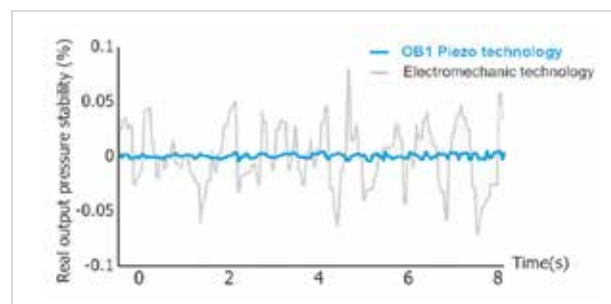
- 1. Pressure & Vacuum Source** : 압력펌프 또는 진공펌프를 연결합니다.
- 2. Monitoring** : Elveflow Smart Interface Software로 압력수치와 Flow rate를 조절할 수 있습니다.
- 3. Sample** : 압력을 주입하여 Sample을 이송합니다. 또한 진공을 이용하여 주입된 Sample을 다시 흡입할 수 있습니다.
- 4. Chip** : OB1 Pressure & Vacuum Controller는 Sample의 정밀하고 미세한 이송을 가능하게 합니다.

CHANNEL PRESSURE RANGE	0 to 200 mbar (0 to 2.9 psi)	0 to 2,000 mbar (0 to 29 psi)	0 to 8,000 mbar (0 to 116 psi)	-900 to 1,000 mbar (-13 to 14.5 psi)	-900 to 6,000 mbar (-13 to 87 psi)
Pressure Stability	0.005% FS 10 µbar (0.00014 psi)	0.005% FS 100 µbar (0.0014 psi)	0.006% FS 500 µbar (0.007 psi)	-900 to 500 mbar : 0.005% FS 100 µbar (0.0014 psi)	-900 to 2,000 mbar : 0.005% FS 350 µbar (0.05 psi)
Response Time	Down to 9 ms				
Settling Time	Down to 35 ms				
Minimum Pressure increment	0.006% FS 12.2 µbar - 0.00017 psi	0.006% FS 122 µbar - 0.0017 psi	0.006% FS 480 µbar - 0.007 psi	0.0064% FS 122 µbar - 0.0017 psi	0.0061% FS 420 µbar - 0.006 psi
Input Pressure	1.5 bar - 10 bar non corrosive, non explosive, dry and oil-free gases, e.g. air, argon, N ₂ , CO ₂ , ...				
Input Vacuum	-			Any value from 0 to -1 bar	
Liquid Compatibility	No liquid should enter the OB1. Any aqueous or organic solvent, oil or biological sample solution can be propelled				

Responsiveness



Stability



Plug & Play Instruments

AF1 Dual Pressure & Vacuum



The only microfluidic instrument in the world

Pressure & Vacuum이 같은 채널에서 가능한 Generator

구성품

- Pressure & Vacuum Generator
- Pressure & Vacuum Controller
- Software (Elveflow Smart Interface)

Option

- AF1 Connection Kit
- Kits
- Reservoirs
- Flow Sensor
- Compressor

제품 상세 설명

AF1 Unit Pressure range Premium	0 to 200 mbar (0 to 2.9 psi)	0 to 1600 mbar (0 to 23 psi)	Dual Pressure & Vacuum Controller -700 to 1000 mbar (-10 to 14 psi)
Type of pressure	Positive	Positive	Negative & Positive
Negative & Positive	0.006 % FS 12.2 µbar - 0.00017 psi	0.006 % FS 122 µbar - 0.0017 psi	0.006 % FS 122 µbar - 0.0017 psi
Pressure Stability	100 µbar (0.0014 psi) i.e. 0.05 % Full Scale	1 mbar (0.014 psi) i.e. 0.05 % Full Scale	-700 to 500 mbar : 1 mbar 500 to 1000 mbar : 5 mbar
Response Time	50 ms		
Settling Time	Down to 40 ms		
Supply Pressure (min - max)	Integrated pump No pressure source needed	Pressure supply needed (1.5 bar min, 2.5 bar max)	
Liquid Compatibility	Any aqueous or organic solvent, oil, or biological sample solution can be propelled		
Power Consumption	15 W (100 V to 240 V - 50 Hz to 60 Hz)		
Output Connectors	Stainless steel female luer lock		

Other Products

MFS



- Microfluidic Flow Sensor
- 느린 유량도 정밀하게 모니터링 가능
- 빠른 Sensing 속도(40ms)
- Internal volume 1 µl로 Dead volume 최소화
- Flow Range별 구성가능
- PEEK 재질로 높은 화학내성
- ※ 단독으로 사용불가.
OB1, AF1, Flow Reader와 함께 사용가능

MUX



- Flow Switches
- Flow Displacement < 10nl
- Flexible : 최대 256개의 Valve
- Software로 제어가능
- 사용조건에 따라 제품 구성

Flow Reader



- 0.07uL to 5000uL/min 넓은 Sensing 범위
- 4개의 채널에서 각각 유량 Reading 가능
- Flow Sensor, Pressure Sensor와 호환

MPS



- Microfluidic Pressure Sensor
- 유체가 이동할때 발생하는 압력 Sensing
- 0.2%이하의 정확성
- 1psi-100psi 까지 Range별 제품 구성
- Dead Volume 7.5 µl로 최소화
- OB1 및 Flow Reader와 호환

Microfluidic Bronkhorst Coriolis Flow Sensor

• BFS _ Microfluidic Bronkhorst Coriolis Flow Sensor



OUTSTANDING PERFORMANCES

- 정확성, 안정성, 반응시간, 재현성 등의 성능 우수



ONE SENSOR SUITED TO A LARGE RANGE

- 하나의 센서로 최소 1.6 $\mu\text{L}/\text{min}$ 에서 최대 500 ml/min 까지 (모델에 따라 상이)



WIDE LIQUID COMPATIBILITY

- 물, 오일, 알코올, 혼합물 등의 다양한 샘플 사용 가능

Measure your flow rates with unmatched precision

- Direct mass flow measurement, independent of fluid properties
- Compatible with all liquids
- Excellent accuracy (0.2% of measured value)

Specification

CORIOLIS FLOW SENSOR	BFS 1	BFS 1+	BFS 2	BFS 3
Flow range	0.1 g/h to 200 g/h		1 g/h to 2,000 g/h	30 g/h to 30,000 g/h
Minimum flow rate (water)	1.6 $\mu\text{L}/\text{min}$		16.6 $\mu\text{L}/\text{min}$	500 $\mu\text{L}/\text{min}$
Maximum flow rate (water)	3.3 mL/min		33.3 mL/min	500 mL/min
PERFORMANCE				
Mass flow accuracy liquids	up to $\pm 2\%$ of rate		up to $\pm 0.2\%$ of rate	
Repeatability	$\pm 0.05\%$ of rate $\pm 1/2 (ZS^* \times 100/\text{flow})\%$ based on digital output			
Zero stability (ZS)	$< \pm 0.02$ g/h		$< \pm 0.2$ g/h	$< \pm 6$ g/h
Density accuracy	$< \pm 5$ kg/m ³			
Temperature accuracy	± 0.5 °C			
Temperature effect	Zero drift : ± 0.01 g/h/°C		Zero drift : ± 0.02 g/h/°C	Zero drift : ± 0.5 g/h/°C
Mounting	Any position, attitude sensitivity negligible			
Device temperature	0-70 °C			
Response time (t 98 %)	0.2 s to fill the tubing then 35 ms			
MECHANICAL PARTS				
Wetted material	Stainless steel 316L or comparable		Stainless steel 316L or comparable	
			Optional: Hastelloy-C22	Optional: Hastelloy-C23
Pressure rating	200 bar		200 bar: higher on request	
Sensor inner diameter	250 μm		0.5 mm	1.3 mm
Microfluidic fitting type	1/4-28"		SwageLok	
Internal volume	13 μL		0.45 mL	0.82 mL
Calibration	/		Individual calibration certificate	

Microfluidic Inline Pressure Sensors

• MFP _ Microfluidic Inline Pressure Sensors



Pressure measurement with no dead volume and FDA certified

- Accuracy up to 2% Full Scale
- 1 range: 0 – 16 bar / overload 25 bar
- No dead volume
- Flow rate up to 100 ml/min
- Compatible with gas and liquid
- Interactivity with other Elveflow instruments

Specification

PARAMETERS	VALUE
Flow rate	up to 100 mL/min
Measurement Parameters	0 to 16 bar
Feed	12 to 30 VDC
Material	Housing - coated aluminum Interior flow channel - FFKM Molding - TPU
Signal	0.1 bis 10 V
Electrical Connection	"push-pull"connector / M8 sensor plug
Mechanical Connection	LUER-LOCK DIN EN 1707
Operating Temperature	15 to 45°C
Internal volume	205 µL
Dimension	inner diameter: between 4mm and 1.8mm length: 31.2mm

Microfluidic Distribution Valve

MUX DISTRIBUTION

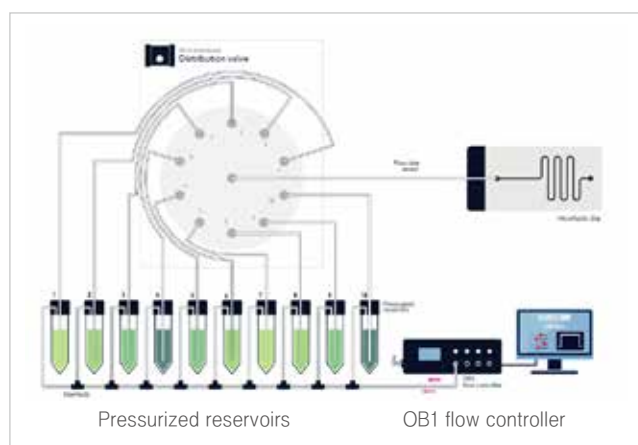


새로운 12/1 Rotary Selector Bidirectional Valve로
미세 유체 실험 공정을 자동화 하십시오

제품 특징

- 순차적 미세 유체 주입
 - 생물학적 매체와 화학 용액을 빠르게 교체
- 미세 유체 분석 공정을 자동화
 - 시퀀스 프로그래밍을 통한 자동화로 공정 시간 절약
- Rotary Selector Valve
 - 최대 12가지 액체간의 빠른 주입 전환
- Microfluidic chip 으로 샘플 주입
 - 1샘플을 12포트로 나누어 주입하거나 12샘플을 하나의 포트에 병합하여 주입 가능

EXAMPLE: FAST MEDIUM SWITCHES



KEY ADVANTAGES

- 작은 내부 볼륨, Zero dead volume
- 빠른 포트간 전환 (평균 156ms)
- 부드러운 포트 전환으로 유체 흐름 중단이 발생하지 않음
- 손쉬운 설정 및 작동 방법
(plug & play software+standard fluidic connection)
- 회전 감도 설정 가능
- 높은 화학적 호환성

Specification

PARAMETERS	VALUE
Port to port switching time (ms)	156 ms
Max recommended pressure	7 bar
Internal diameter	0.5 mm
Internal volume	3.5 μ L
Carryover volume	1.7 μ L
Dead volume	None
Wetted materials	PCTFE, PTFE
Number of ports	13
Number of positions	12
Operating temperature	5-40°C
Operating Humidity	20-70% noncondensing

Microfluidic Heater - Cooler

The fastest heater & cooler for live-cell imaging

Heater - Cooler



Change the temperature of your sample within seconds during live-cell imaging

Chip의 온도변화를 빠르게 줄수있는 온도 조절기!

구성품

- Microscope에 맞는 Chip Base
- Chip 고정용 Clip 및 Chip Holder

Option

- Fluidic actuation system
- Thermalization chips kit
- Exchanger

제품 상세 설명

1. Pipette을 이용하여 sample을 chip위에 올려줍니다.
2. 전용 Plate에 chip을 고정시킨 후 microscope에 장착시켜 줍니다.
3. 액체를 흘려줄수 있도록 연결한 후에 chip을 재고정 시켜 줍니다.
4. 전용 프로그램 'Cherrysoft'를 이용하여 온도를 빠르게 변경해주면서 실시간으로 관찰해줍니다.



Specification

PARAMETERS	CherryTemp FEATURES
Input voltage	12-24V nominal
Power supply	120V-60Hz / 230V-50Hz
Number of channels	2 independent temperatures
Temperature sensor types	pt 100
Temperature sample homogeneity	<0.5°C
Temperature precision	+/- 0.1°C
Temperature absolute accuracy	+/- 0.5°C
Temperature range	5°C to 45°C
Thermal power control	PID, performance-optimized
Connection type	USB
Control interface	CherrySoft™ software
CherryLoop fluidic actuation	High precision pulseless pressure pump
CherryTemp box dimensions LxWxH (mm)	270 x 190 x 170
CherryLoop box dimensions LxWxH (mm)	210 x 210 x 70
Heat exchanger dimensions LxWxH (mm)	86 x 54 x 22
Heat exchangers weight	400g

Microfluidic Flow Control Bubble Trap

NEW

● Bubble Trap *Degasser 없이 이송 중 발생하는 기포를 제거해보세요!*



제품 특징

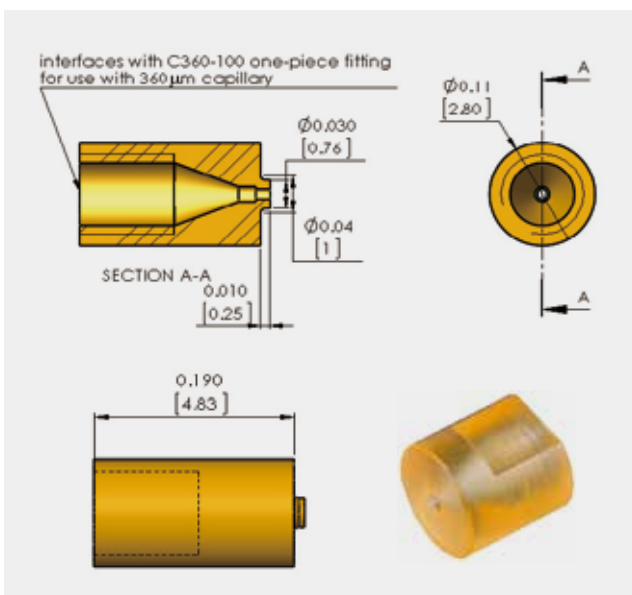
- 효과적인 기포제거
- 3가지의 Internal volume : 23 μ L (S), 95 μ L (M), 362 μ L (L)
- 내화학 재질 - PEEK body & PTFE 멤브레인
- 간단한 Membrane 교체
- Flow rate : 5 μ L/min ~ 60 ml/min
- Autoclavable

Specification

Front	PEEK
Back	PEEK
Membrane	Porous PTFE (10 μ m pores)
Threaded ports	1/4" - 28UNF
Internal Volume	23 μ L (S), 95 μ L (M), 362 μ L (L)
Inlet & Outlet port \varnothing	3mm
Vacuum port \varnothing	2mm
Pressure rating	30psi (2 bar)

Microfluidic Automation & System Bonded Chip Connectors

● Bonded Chip Connectors *이제 Chip에 꽃지 말고 Fitting 하세요!*



제품 특징

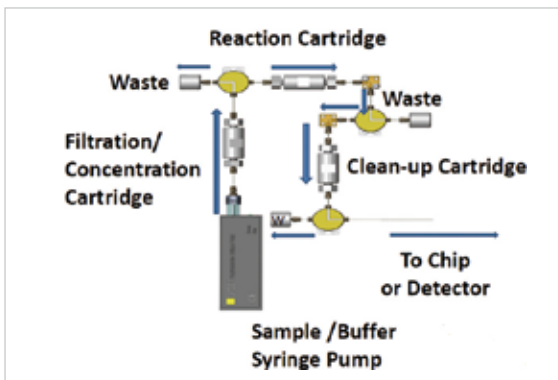
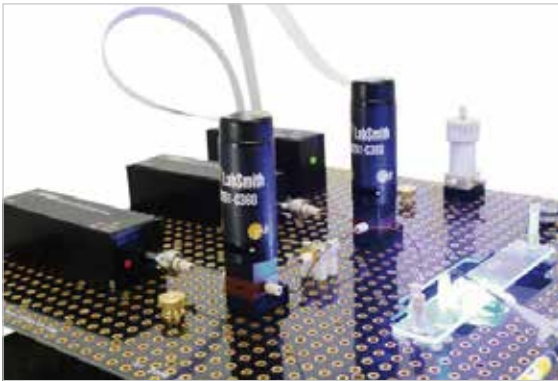
- Microchannel에 부착하여 Fitting 가능
- Channel 안쪽까지 구성되어 Leak 없음
- 360 μ m, 1/32" Tubing Fitting 가능

Fitting specification

	One-Piece Fitting For connecting capillary or tubing to CapTite™ components. PEEK™	Fitting & Plug
	Two-Piece Adapter For adapting a CapTite™ component to a different microfluidic tubing size. Material: PEEK™	

Microfluidic Automation & System uProcess System

기존에 없었던, 국내에는 없는 전혀 새로운 방식의 Lab-on-a-chip 전문 Maker!
Microfluidic (미세유체) 이송에 관련된 전제품 Line up



제품 특징

- 액체 이송 과정을 자동으로 제어가능
- System을 구성하기 위한 획기적인 Software
- 정압,정속의 흐름
- 빠르고 간편한 자동화 구도

구성품

- Syringe pump (0.005 ~ 5,600 μ l/min)
- Automation valve (3, 4port)
- 각종 Fitting류
- Cartridge류
- 전제품 고정용 Breadboard
- PC Control 가능한 Software 기본 제공

Option

- High voltage Control
- Timing & Synchronization
- Microscopes

LabSmith uProcess™ System 구성

D 4VM01 Valve Manifold는 AV201 혹은 AV202 Automated Valve를 최대 4개까지 control 가능합니다.

G 4AM01 Analog Manifold controls는 uPS pressure sensors를 최대 4개까지 control 할수 있습니다.

A Electronic Interface Board(EIB)는 SPS01 syringe pump, AV201 automated valve, uPS01 Pressure sensor를 사용할수 있습니다.

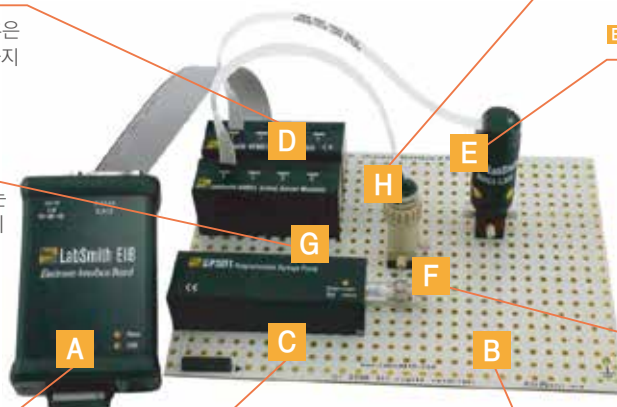
H uPS series는 압력 센서로 압력을 감지하고, 조절할수 있습니다. syringe pump의 정압, 정속 mode를 사용하면 조절가능 합니다.

E AV201 Automated Valve 입니다.

F CapTite™는 microfluidic을 구성하는데 필요한 모든 부품을 완벽히 지원해 출수 있습니다. (사진에 보이는 것은 Breadboard Reservoir, one-piece fitting, capillary tubing 입니다.)

C SPS01는 프로그램 가능한 Syringe pump 입니다.

B uPB 혹은 iBB breadboard(사진 : uPB-05)는 선택 가능하며, 간단하게 부품을 장착 할수 있도록 설계되어 있습니다.



Microfluidic Automation & System uProcess System

Labsmith 만의 특색있는 제품

SPS01 Syringe pump



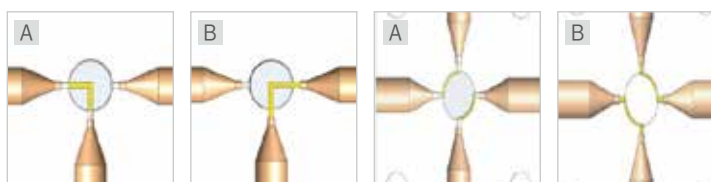
- 자동 유체 이송
- Software를 통한 Control 가능
- Zero dead-volume의 구조
- Low Flow rate : 50 nl/min

PERFORMANCE						PHYSICAL	
Model	Max Volume(μl)	Min Flow Rate(μl/min)	Max Flow Rate(μl/min)	Step Size (μl)	Max Pressure (psi)	Dimensions	100 x 25 x 20 mm (L x W x H)
SPS01-04	5	0.05	280	0.008	>500	Housing Material	Delrin®
SPS01-08	10	0.1	560	0.017	>500	Syringe Material	Glass with PEEK™ tip
SPS01-20	20	0.2	1100	0.033	>500	Plunger Material	Stainless steel with Teflon® tip
SPS01-40	50	0.5	2800	0.083	300	Wet Volumes	5, 10, 20, 50, 100 μL (전 volume 교체가능합니다.)
SPS01-80	100	1	5600	0.17	200		
Volume Accuracy			~1%(infuse direction)			Stroke Length	12 mm
Flow Rate Accuracy			~1%(infuse direction)			Cleaning	Sterile 가능
Service Temperature Range			10-80°C				Autoclave 가능

AV Series Automated Valves



- 적은 공간사용
- 적은 Swept volume (nl)
- 다른 uPROCESS 장비와 쉽게 연결가능



AV201 Valve의 Position A,B (노란색은 Swept volume을 나타냄)

AV202 Valve의 Position A,B (노란색은 Swept volume을 나타냄)

VALVE	THROUGH HOLE DIAMETER	SWEPT VOLUME	VALVE VOLUME
AV201-C360	0.01"[250 μm]	130 nL	170 nL
AV201-T132	0.01"[250 μm]	130 nL	170 nL
AV201-T116	0.02"[510 μm]	520 nL	1.1 μL
AV-202-360	0.01"[250 μm]	90 nL	130 nL

uProcess Pressure Sensors & Connectors

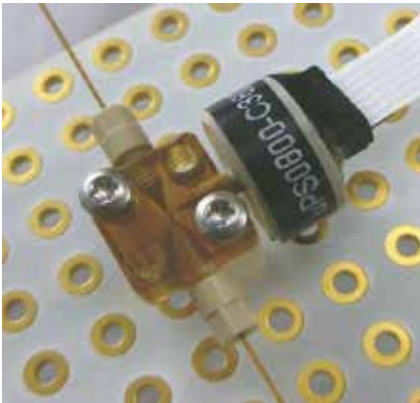
• uPS Pressure Sensor

- Compact, Low-dead-volume
- uProcess™ Software Interface
- Pressure range : 0~250 kPa abs
0~800 kPa abs

uPS Product Key & Selection Criteria

uPSXXXX-YYY-ZZZ

XXXX = Pressure max; YYY = Component size; ZZ = Pressure accuracy



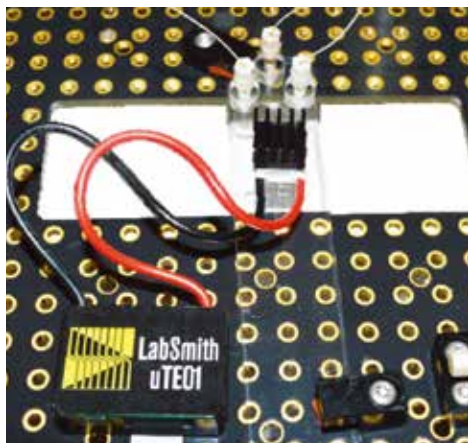
PERFORMANCE		
X	Pressure Range	Resolution
0250	0-250 kPa abs (0-35 psia)	1 Pa (0.00014 psi)
0800	0-800 kPa abs (0-155 psia)	5 Pa (0.0007 psi)
Y	CapTite™ Component Interface	
360	360 μm & 1/32"	
116	1/16"	
Z	Accuracy(% full scale)	
10	1.00%	

PHYSICAL	
Temperature Range(for specified accuracy)	15-60°C
Working Temperature	0-100°C
Damage Pressure	2X maximum pressure

• Cap Tite™ & Connectors (Microfluidic Components)

PICTURE	DESCRIPTION	PART	APPLY FOR		
			360 μm Capillary	1/32" Tubing	1/16" Tubing
	One-Piece Fitting : capillary나 tubing에 사용가능 Material : PEEK™	Fitting	C360-100	T132-100	T116-100
		Plug	C360-101	C360-101	T116-101
	Two-Piece Adapter[부품 size(male)]-A[tubing size(female)] Material : PEEK™		T116-A360	T116-A132	C360-A116
			T132-A360	C360-A132	
	Interconnect 재순환 시키거나, flow를 혼합시킬때 사용 Material : Ultem® *표시는 한쪽은 360 μm, 한쪽은 1/32"인 제품을 의미함	Union	C360-202	T132-202	T116-202
			A360-132-202	A360-132-202	
		TEE	C360-203	T132-203	T116-203
		CROSS	C360-204	T132-204	T116-204
		Elbow	C360-205	C132-205	T116-205
	Y	C360-203Y	T132-203Y	-	
	Breadboard reservoir 1.1mL 저장소로, 4port를 이용하여 4방향으로 연결 가능 1개의 뚜껑과 2개의 Viton o-ring이 포함되어 있음 Material : PEEK™		C360-BBRES	-	T116-BBRES
	Breadboard 4" x 6" platform size 으로 fluid circuit 전제품을 고정 할수 있는 고정대		LS-600		

Thermal Control Products



Thermal Control

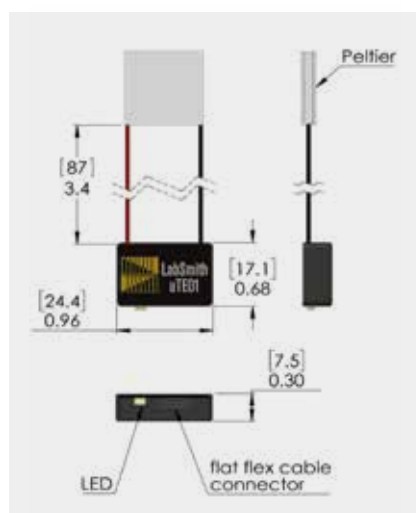
- 하나의 장비로 Heating, Cooling 모두 가능
- Compact한 사이즈로 Microfluidics 실험에 적합
- Peltier 소자를 이용하여 안정적인 사용
- 3가지 크기의 Peltier 소자 선택가능

Thermal controller

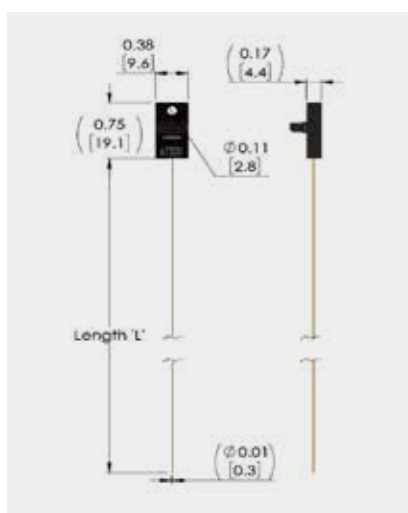
uTE-Series Thermal-Electric Module		P/N : uTE01-[PELTIER]		
필요장비	4PM01 4채널 매니폴드 모듈(6-pin flat flex ribbon cable 연결)			
최대온도	최대 130℃			
Peltier Option [PELTIER]	Size(mm)	Qmax(W)	Vmax(V)	I _{max} (A)
40808	8.3 x 8.3 x 2.3	4.3	3.9	2
132020	20 x 20 x 4.0	13	3.7	6
151530	15 x 30 x 3.7	15	4.2	6

uTS-Series Temperature Sensor		P/N : uTS01-[TC]-[L]		
온도범위	-150℃ ~ 200℃			
정확도	0.5℃			
Resolution	0.001℃			
Sensor type	K type thermocouple			
필요장비	4AM01 4채널 매니폴드 모듈(6-pin flat flex ribbon cable 연결)			
길이	20 or 60 cm (Customizing 가능)			
Sensor Option [TC]	Wire gauge	Tip Diameter(mm)	Tip Insulation	Wire Insulation
STD	36	0.3 - 0.4	None	PFA
INS	24	2.5 - 3.0	FEP	FEP

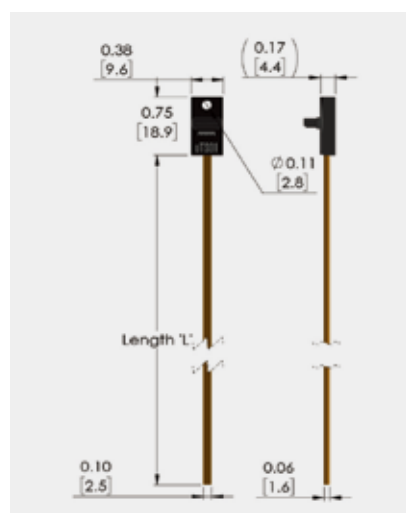
uTE01-[PELTIER]



uTS01-STD-[L]



uTS01-INS-[L]



High voltage controller

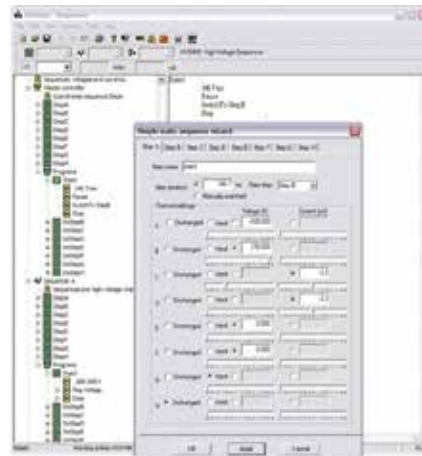
LabSmith HVS448 High Voltage Sequencer Complete electric field control for microsystem analysis



- Current 를 관찰하면서 Voltage 조절가능 (최대 ± 3.0 kV)
- Voltage 를 관찰하면서 Current 조절가능 (최대 ± 100 mA)
- 정확한 Multimeter처럼 Current와 Voltage 감지

Application

- Pulsed-Field Electrophoresis
- Dielectrophoresis
- Lysis
- Electroporation
- Chip-Base Electric Manipulation
- Array Assays
- Multi-channel Separation



SUPPLY						
Model	Max Output Voltage	Max Voltage Difference	Max Output Current	Max Output Current Per Channel	Current Monitor Resolution	Voltage Monitor Resolution
8000D	± 4000 V	8000 V	± 2.5 mA	± 1.8 mA	250 nA	150 mV
6000D	± 3000 V	6000 V	± 3.2 mA	± 2.4 mA	300 nA	100 mV
3000	± 3000 V	3000 V	± 6 mA	± 4.8 mA	300 nA	100 mV
300D	± 1500 V	3000 V	± 6 mA	± 4.8 mA	500 nA	50 mV
1500	± 1500 V	1500 V	± 12 mA	± 10 mA	500 nA	50 mV
800	± 800 V	800 V	± 25 mA	± 20 mA	1 μ A	25 mV

MONITOR			
Property	Min	Max	Notes
Monitor time resolution	-	100 μ s	-
Voltage setting time	-	500 μ s	Step load change or step voltage change
Current setting time	-	10 ms	Step load change or step voltage change

SEQUENCE PROGRAMMING			
Property	Min	Max	Notes
Number of step programs per sequence	-	8	-
Total number of instructions	-	1024	-
Trigger programming	Arbitrary logical comparison of 4 digital inputs and 8 channel outputs. Individual program for each		

Microfluidic Automation & System LabSmith Package

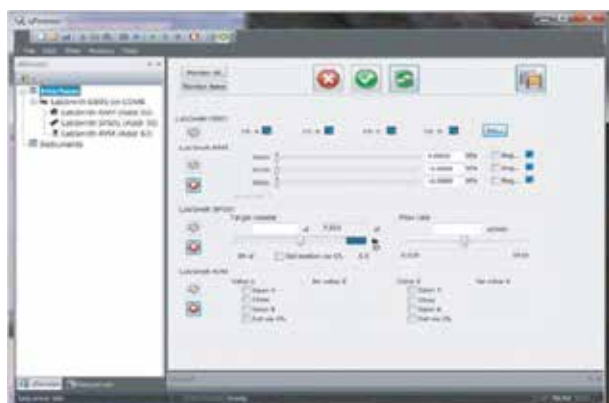
◉ LabSmith Package 구성품 안내

Valve Starter Package			
Description	Qty	AV201-C360-PKG	AV201-T116-PKG
Two-position Automated Valve	2	AV201-C360	AV201-T116
4 Valve Manifold	1	4VM01	4VM01
Electronic interface controller with uProcess software	1	EIB-100	EIB-100
uProcess breadboard with 5 device connections	1	uPB-05	uPB-05
One-piece fitting, interfaces valve with capillary tubing	10	C360-100	T116-100
Tools for component & breadboard installation	1 each	LS-Hex LS-Torx LS-Screws.25	LS-Hex LS-Torx LS-Screws.25

Syringe Starter Package			
Description	Qty	SPS01-C360-PKG	SPS01-T116-PKG
SPS01 syringe pump with 1 syringe glass and plunger set.	1	SPS01-004-C360 SPS01-020-C360 SPS01-080-C360	SPS01-080-T116
Electronic interface controller with uProcess software	1	EIB-100	EIB-100
uProcess breadboard with 5 device connections	1	uPB-05	uPB-05
Tool set for changing syringe glass/plunger	1	SPS-TOOLS	SPS-TOOLS
One-piece fitting, interfaces syringe with capillary tubing	2	C360-100	T116-100

Pressure Sensor Starter Package			
Description	Qty	uPS01-C360-PKG	uPS01-T116-PKG
uPS Pressure Sensor	2	uPS0800-C360-10 uPS0250-C360-10	uPS0800-T116-10 uPS0250-T116-10
4 Sensor Manifold	1	4AM01	4AM01
Electronic interface controller with uProcess software	1	EIB-100	EIB-100
uProcess breadboard with 5 device connections	1	uPB-05	uPB-05
Tee Interconnect	2	C360-203	T116-203
One-piece fitting, interfaces interconnect with capillary tubing	5	C360-100	T116-100
Tools for component & breadboard installation	1 each	LS-Hex LS-Torx LS-Screws.50	LS-Hex LS-Torx LS-Screws.50

◉ 전제품 software 기본 제공



uProcess™ Software는 uProcess™ 장비 Control과 자동화 과정을 제작할수 있는 간편한 Interface를 제공합니다.

Programmable Automated Operation

- uProcess™ Software는 사용하기 편한 Interface를 제공합니다.
- uProcess™를 컴퓨터에 연결하면 환경설정, 모니터링, System 컨트롤이 가능합니다.
- Automatic sequence를 이용하면 Multistep, 장치 조정을 쉽게 Program 할 수 있습니다.
- uPS 압력 센서는 Syringe pump와 Valve와 같이 사용 가능하며, 정속, 정압을 가능하게 합니다.

Microfluidic Automation & System Microscope

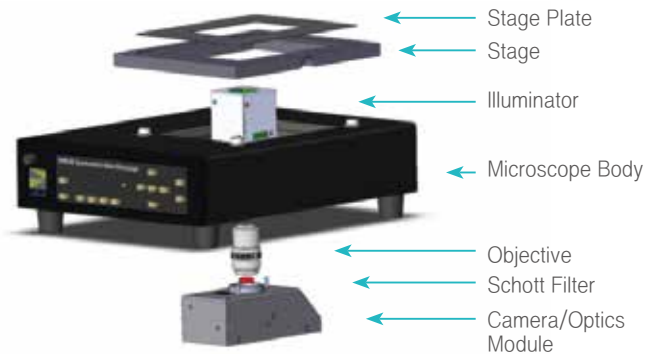
LabSmith Microscope



- High-sensitivity video
- Synchronous pulsed fluorescence illuminator
- x-y축으로 움직이면서 초점을 맞춤
- Microscope에 맞춘 획기적인 Software
- 고화질 사진과 동영상 전부 촬영 가능

Application

- uTAS research and prototyping
- 유전자, 단백질 chip 연구
- 일반적인 소형 자동화 실험
- 폐쇄된 Microsystem control
- 자동화 방식 연구
- Array assays • 혈액 분석
- Forensics • Particle Image Velocimetry (PIV)



PHYSICAL		
Dimensions	21 x 27x 8.5 Cm(8.3 x 10.5 x 3.3") W x L x H	
Enclosure	Black enamel-coated, anti-RFI steel enclosure	
Weight	2.8 kg (6.2 lbs)	
Power	Voltage	90-264 VAC, 47-63 Hz
	Current	0.5 A
Mounting	Four 8-32 threaded holes on 17.8 x 22.9 cm (7.0 x 9.0") rectangle	

CAMERA MODULES	
Snap-in modules with CCD camera, optional fluorescence filter and threading for standard DIN microscope objective.	
RS-170-BW, EPI Modules	High sensitivity analog black & white camera with 640 x 480 pixels
	600 lines of resolution, 30 frames per second
RS-170-C	490 lines of resolution, 30 fps, S Video output

TRAVERSE - FOCUS		
Motorized traverse and focus controlled through software and front panel		
	Resolution	Range
X-Y traverse	10 μ m	5 cm x 7.5 cm
Z-traverse	1 μ m	3mm

CONTROL AND ACQUISITION SOFTWARE	
uScope™ software included:	
Automated controls for illuminator, x-y traverse and focus	
Save and process videos and images	
Particle Image Velocimetry	
LabVIEW™ drivers available / Software Developers' Kit (C, C++) included	

SCHOTT FILTERS FOR CAMERA MODULES	
495, 515, 530, 550, 570, 590, 610, 630, 645, 655 nm wavelengths*	

OBJECTIVE				
POWER	NUMERICAL APERTURE	WORKING DISTANCE	FOCAL LENGTH	FIELD OF VIEW
4X	0.10	15.97 mm	31.0 mm	1.5 x 1.5 mm
10X	0.25	6.3 mm	16.76 mm	0.6 x 0.6 mm
20X	0.40	3.3 mm	8.55 mm	0.3 x 0.3 mm

* Illuminator LED와 wavelengths 가 있는 Schott filter의 자료는 따로 요청 바랍니다.

Microfluidic Automation & System Syringe pump

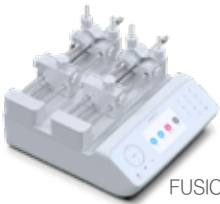
○ Syringe pump



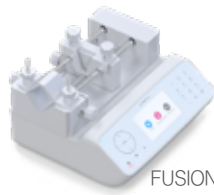
FUSION 100X



FUSION 200X



FUSION 4000



FUSION 6000



Microfluidic에 쉽게 적용 가능한 Syringe Pump μl, nl, pico liter 유체 실험용

- 미세유량조절
 - pico liter 단위로 유량 조절가능
 - 최소 0.1 pl/min
- Full touch screen의 직관적인 사용자 인터페이스
- Multi syringe rack : 2-11 rack (fusion 100x, fusion 200x)
- Simple and Intuitive Operation
- 제조사별 주사기 데이터베이스 입력
- 사용자가 원하는 주사기를 검색 가능
- Variable Force Motor
- 모터의 힘을 조절 가능하여 민감한 어플리케이션에 적용가능
- External Control
 - D9 RS232, USB, and TTL available

Model	Mode	Syringe Channel/ Volume	Min. Flow rate	Max. Flow rate	Linear Force	Accuracy	Reproductivity	Connectivity	Programming Mode
Fusion 100x	Infusion	2 / 0.5μL-60mL	0.0001μL/min (0.5μL syringe)	157mL/min (60mL syringe)	55lb(25kg)	± < 0.35%	± < 0.05%	○	○
Fusion 200x	Infusion/ Withdraw	2 / 0.5μL-60mL	0.0001μL/min (0.5μL syringe)	84.7mL/min (60mL syringe)	65lb(29.4kg)	± < 0.35%	± < 0.2%	○	○
Fusion 4000	Infusion/ Withdraw	2 / 0.5μL-100mL	0.0001μL/min (0.5μL syringe)	170.5mL/min (100mL syringe)	100lb(45.3kg)	± < 0.35%	± < 0.05%	○	○
Fusion 6000	Infusion/ Withdraw	1 / 0.5μL-200mL	0.0001μL/min (0.5μL syringe)	271mL/min (200mL syringe)	500lb(227kg)	± < 0.35%	± < 0.05%	○	○

○ Racks



11 Channel Racks(Fusion 100x, Fusion 200x)



4 Channel Racks (Fusion 6000)

○ Foot Switch



Fusion Series Only

Microfluidic Automation & System Tubing pump

● Reglo ICC

Reglo ICC는 1대로 최대 4개 채널을 독립적으로 운영 가능한 Tubing pump로써, 채널수 만큼 pump를 구매하는 것보다 저렴하게 구성할 수 있습니다.



독립적인 채널 컨트롤 가능!



7개의 키패드로 $\mu\text{l}/\text{min}$ 와 ml/min 로 Flow rate 조절 가능

미세유체를 오염없이 이송가능한 Tubing Pump!

Reglo ICC - 1대로 최대 4대의 기능!

각각의 채널을 독립적으로 사용 가능한 신기술!



제품특징

- 유량 : 0.001 – 43 ml/min (각 채널당)
- 2/3/4 채널, 8 rollers
- 각 채널별 정방향 / 역방향 동시 컨트롤 가능
- 각 채널별 다양한 tubing size 사용 가능
- 3-stopper tubing 사용
- PC 제어 가능한 Windows software 포함
- Dispensing, Continuous flow, Calibration 가능

Specifications

Motor type	Stepper motor
Speed	1 – 100 rpm Digitally adjustable in steps of 0.01 rpm
Difference pressure	max. 1.0 bar(14.5 psi)
Main power connection	100-230VAC/50-60 HZ
Power consumption	30 W
Depth/Width/Height	205X125X170 mm
Protection rating	IP 30

● Tubing Pump

제품특징

- Microprocessor controlled
- 매우 정밀한 pumping
- Stand-by mode (tubing system이 밤새 건조해 지는 것을 방지)
- IPC, IP & IP-N
- 2 $\mu\text{l}/\text{min}$ – 44 ml/min (per channel)
- IPC-N
- 0.4 $\mu\text{l}/\text{min}$ – 11 ml/min (per channel)
- 4, 8, 12, 16, 24 채널
- 8개의 Stainless steel rollers
- Stainless steel housing
- Membrane key-pad와 LED display
- 각 채널별 다양한 tubing size 사용 가능
- 2-stop tubing 사용
- Differential pressure 1.0 bar
- Differential pressure는 tubing의 재질에 따라 좌우되며, 작은 ID size일수록 높은 압력이 가능

미세유체를 오염없이 이송가능한 Tubing Pump!

다채널(최대 24채널)을 정밀하게 이송가능!



Specifications

	IPC and IPC-N	IP and IP-N
Motor type	DC motor 0.4-45 rpm 0.11-11.25 rpm	DC motor 0.4-45 rpm
Speed IPC IPC-N	1-100%, resolution 0.1% $\mu\text{L}/\text{min}$ or mL/min	1-100%, resolution 0.1% rpm, resolution 0.1 rpm rpm, resolution 0.03 rpm
Power consumption	30 W	30 W
Main power connection	230VAC/50Hz, 115VAC/60Hz adjustable	230VAC/50Hz, 115VAC/60Hz adjustable
Protection rating	IP 30	IP 30

Microfluidic Automation & System Fittings & NanoPort™

Microfluidic 맞춤형 소모품

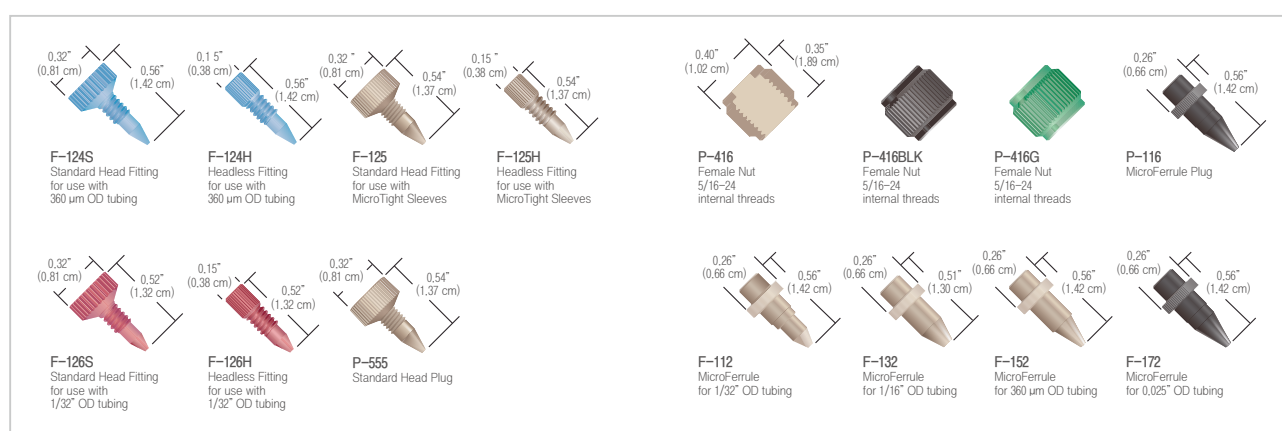
REVODIX에서는 다양한 재질과 사이즈의 소모품을 공급 합니다.

○ Fitting

Capillary tubing을 위한
종합적인 Fitting System
재질 - PEEK Polymer

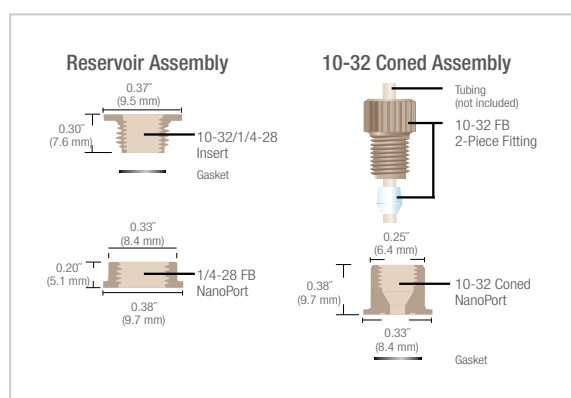
제품 특징

- 360 μm, 1/32" OD tubing에 연결 가능한 전용 Fitting
- Fingertight (손으로 돌려서 연결시키는 방식)을 이용하여 특별한 Wrench가 필요없음
- Headless type을 이용하면 적은 공간에도 효과적인 Connecting 가능
- 125 °C까지 사용가능
- 4,000~5,000 psi (276~345 bar)까지 사용 가능하여 장비 부속품으로도 활용 가능



○ NanoPort™ Assemblies

Chip-based analysis에 적합한 제품
재질 - PEEK and perfluoroelastomer



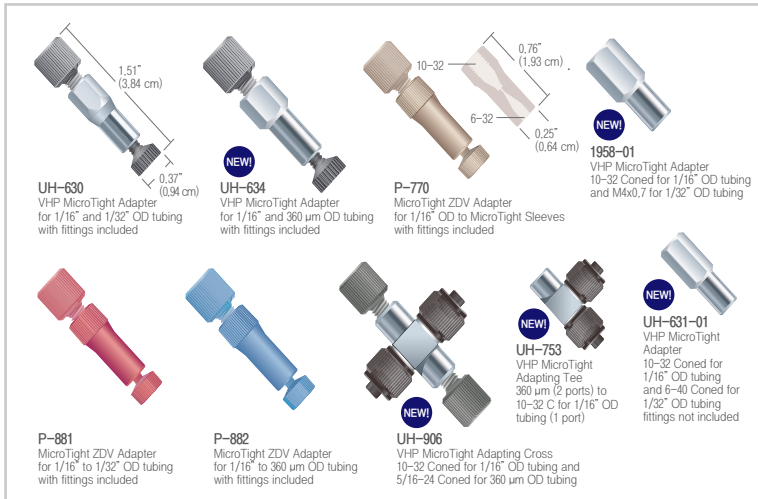
제품 특징

- 최대 1,000 psi (69 bar) 사용가능
- Silicon, quartz, glass 등 여러 polymer에 접착 가능
- Nut, port : PEEK Polymer 재질 (Biocompatible)
Ferrule, gasket : Perlast® perfluoroelastomer
- Dead volume 제거

Application

- Lab-on-a-chip
- 360 μm, 1/32" OD, 1/16" OD Tubing 연결 및 고정
- Perlast® perfluoroelastomer를 이용한 reservoir를 chip 직접 부착 방식

Microfluidic Automation & System Connectors

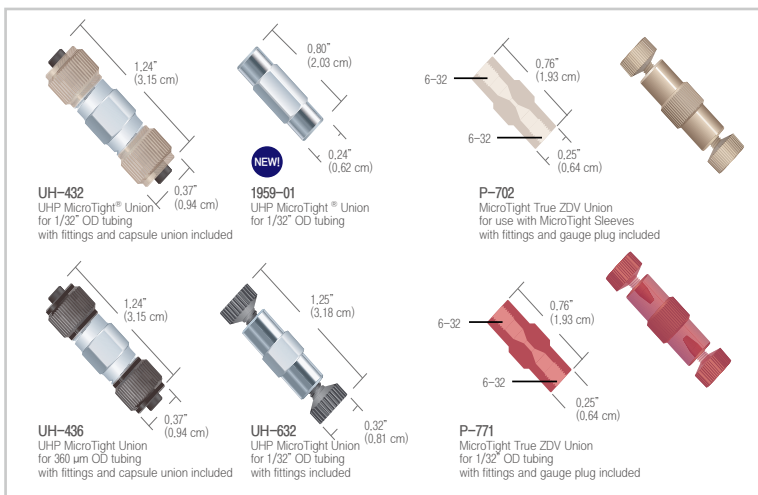


MicroTight Adapters

외경 크기가 다른 일반 tubing과 capillary tubing을 연결해주는 Adapter

제품 특징

- 1/16" OD tubing을 capillary tubing에 편하게 연결시킬수 있는 Adapter
- 1/32" OD 혹은 360 μm OD tubing 연결도 가능
- VHP adapter를 이용하여 최대 12,000 psi (828 bar)까지 사용가능
- ZDV (Zero dead volume)의 connection
- 최대 200°C까지 사용가능



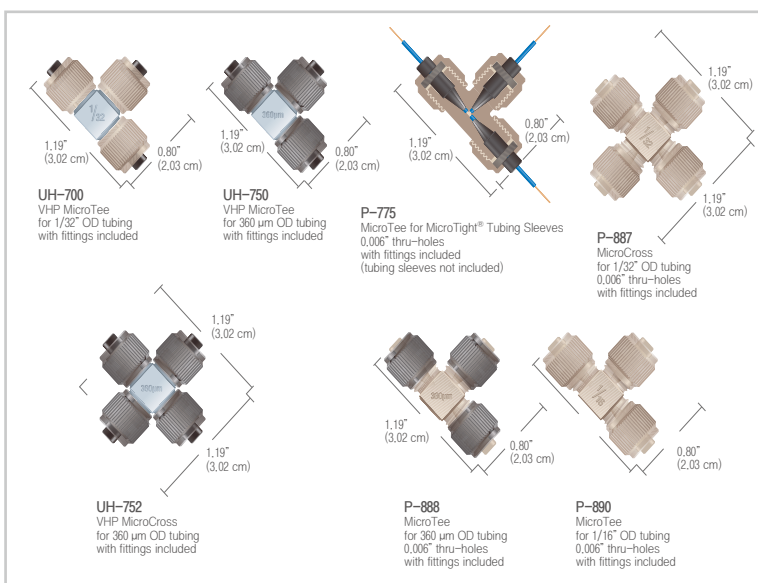
Unions for Capillary Tubing

외경 크기가 같은 capillary tubing을 연결해주는 Union

* VHP Union은 최대 15,000 psi (1,034 bar)까지 사용 가능한 SUS 재질의 Union 입니다.

제품 특징

- Material - BODY : Stainless steel
Fittings : PK/PEEK
- 최대 압력 : 15,000 psi (1,034 bar)
- 1/32" OD tubing 부터 360 μm 까지 사용 가능



Capillary Tubing용 Tees & Crosses

Capillary Tubing을 여러 방향에서 연결해주는 Tee와 Cross

* VHP Union은 최대 15,000 psi (1,034 bar)까지 사용 가능한 SUS 재질의 Union 입니다.

제품 특징

Micro Tees & Crosses

- 최대 압력 : 5,000 psi (345 bar)
- Material : Stainless steel
- Tubing : 1/16", 1/32" OD, 360 μm OD

VHP Tees & Crosses

- 최대 압력 : 5,000 psi (345 bar)
- Material : Stainless steel
- Tubing : 1/32" OD, 360 μm OD

Microfluidic Automation & System Capillary Tubings

Capillary Tubings



Tubing Sleeve

- Capillary tubing을 일반 fitting에 사용하기 위해 사용하는 특별한 tubing
- Material : PEEK, FEP
- 외경이 70 μm 인 tubing까지 사용 가능



Fused Silica Tubing

- Tubing OD Size : 360 μm
- ID(내경) 최소 Size : 20 μm (0.0008")
- Polyimide coating이된 synthetic fused silica로 제조



Capillary PEEK Tubing

- Tubing OD Size : 360 μm , 510 μm , 1/32"
- ID(내경) 최소 Size : 25 μm (0.001")



PEEKsil™ Tubing

- Tubing OD Size : 360 μm , 1/32", 1/16"
- PEEK 로 덮힌 Fused silica

Microfluidic Automation & System Microdiaphragm pump

Microdiaphragm Pump

공간 및 에너지 절약 소형 다이어프램 펌프
Bartels mp6 Series

제품 특징

- 공간절약형 사이즈(30x15x3.8mm)
- 2g 무게
- 2 개의 피에조 액추에이터 사용
- 자가 프라이밍



Model	mp6-gas	mp6-liq	mp6-pi	mp6-pp
Pump Type	Piezoelectric Diaphragm Pump	Piezoelectric Diaphragm Pump	Piezoelectric Diaphragm Pump	Piezoelectric Diaphragm Pump
Dimensions	30 x 15 x 3.8 mm	30 x 15 x 3.8 mm	30 x 15 x 3.8 mm	30 x 15 x 3.8 mm
Power Consumption	~ 150 mW 4	~ 50 mW 4	~ 50 mW 4	~ 50 mW 4
IP-code	IP33	IP33	IP33	IP33
Life Time	5000h	5000h	5000h	5000h
Operating Temperature	0 - 70 °C	0 - 70 °C	0 - 70 °C	0 - 70 °C
Materials	PPSU	PPSU	PPSU, PI	PP, PI
Pressure(LIQUID)		≥ 500 mbar	≥ 500 mbar	≥ 500 mbar
Flow Rate(LIQUID)		8 $\mu\text{L}/\text{min}$ – 10000 $\mu\text{L}/\text{min}$	8 $\mu\text{L}/\text{min}$ – 8000 $\mu\text{L}/\text{min}$	8 $\mu\text{L}/\text{min}$ – 4000 $\mu\text{L}/\text{min}$
Pressure(GAS)	≥ 100 mbar			
Flow Rate(GAS)	≥ 25 mL/min			

