INSTECH

The equipment behind the science.

RODENT INFUSION *and* SAMPLING

2017-2018
Catalog

Sales Policies

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Payment Terms. Net 30 days from date of invoice for customers with established credit. Prepayment or COD may be required if credit has not been established. Visa®, Mastercard® and American Express® are accepted. Unpaid balances are subject to a late-payment fee of 2% per month. See quotation or invoice for currency, payment information and additional terms.

Shipping and Importation Costs. Shipping charges will be added to order. FOB Origin (Plymouth Meeting PA USA). Purchaser is responsible for payment of all import duties, tariffs, taxes, insurance, and other related charges.

Returns. Standard items that have not been used or damaged may be returned within 60 days for a credit or refund. A 20% restocking charge will be deducted from the refund or credit in most cases. Instech does not offer refunds or credits on special, custom or made-to-order products, such as infusion kits, peristaltic pump tube sets, special swivels, custom catheters, or products with custom modifications. You must receive a Return Material Authorization number (RMA) before returning any equipment; see www.instechlabs.com/Support to request one.

Distributors. Products may be ordered directly from Instech or one of our approved distributors (see www.instechlabs.com/distributors.html). Some products may not be available through distributors.

Price Changes. Prices are subject to change without notice.

CONTENTS

Follow the links throughout this catalog for prices on specific items or download a complete price list from www.instechlabs.com/prices.

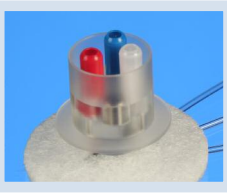
We were there at the beginning. In the late 1960s Michael Loughnane developed a fluid swivel for a researcher at the University of Pennsylvania. He founded Instech Laboratories in 1971 and since then he and his team have designed hundreds of devices for laboratory animal research, including most of the products featured in this catalog.

NEW PRODUCTS

OrchesTA™ Software 52

The OrchesTA software and pump network can reduce infusion toxicology study labor costs by 50%. Recent enhancements cover studies with loading doses and variable flow rates.

Rat Vascular Access Buttons™ 28



Updated designs feature magnets for connecting tethers and protective caps with minimal force on the animal. One, two, three and even four channel models are now available.

Mouse Buttons 33

Vascular Access Buttons™ have become the new standard for exteriorization of mouse catheters. A clever magnetic tool simplifies handling and caps permit group housing.

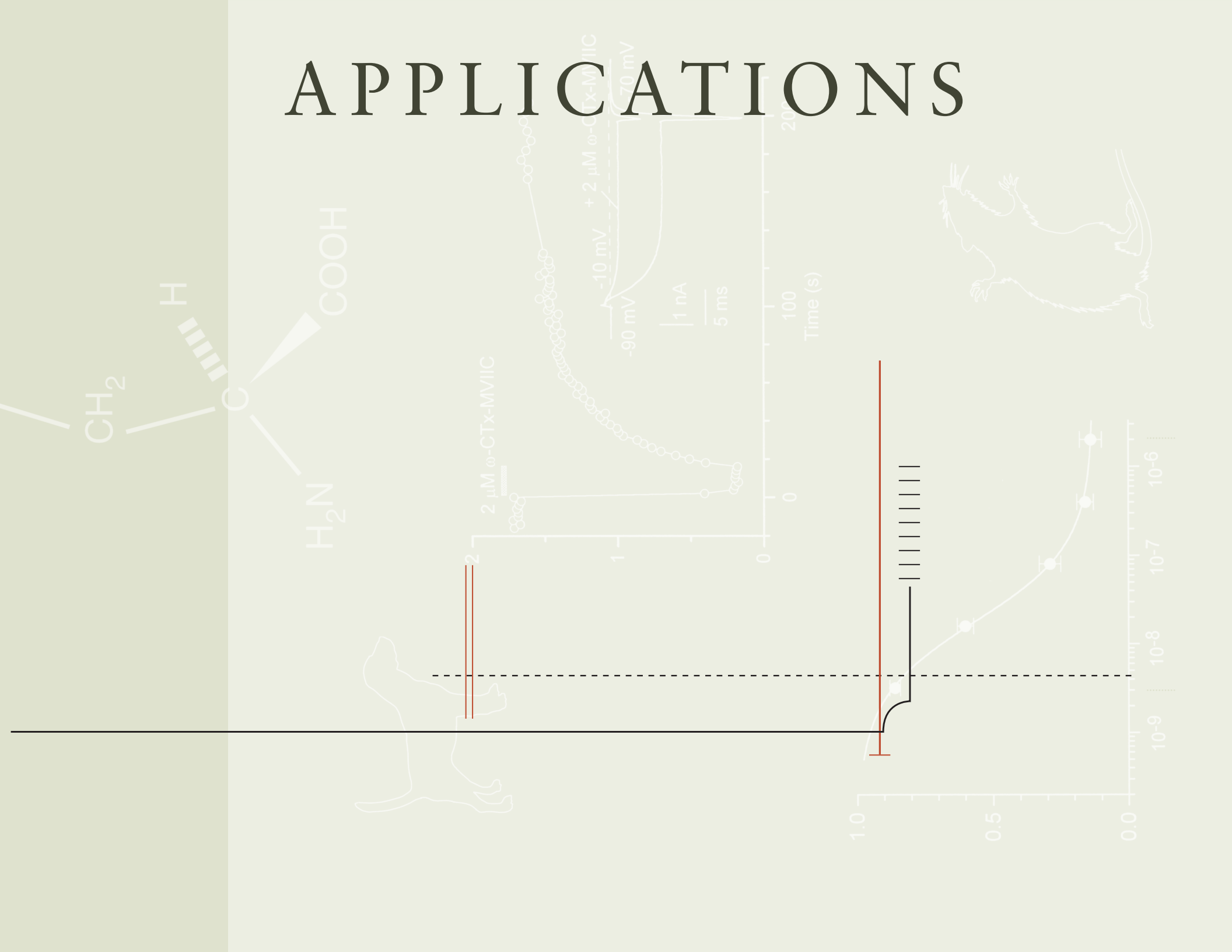
28ga PinPort™ 25

This latest addition to the successful PinPort line connects to PE-10 tubing. Useful for intrathecal drug delivery.

This catalog contains dozens of products released during the past year. To learn about new products as soon as they are available, follow @instechlabs.

3Rs Many of the advances in this catalog have been the result of researchers and Instech working together to improve animal welfare. Throughout this catalog this symbol highlights the ways Instech's products can be used to reduce and refine.

APPLICATIONS



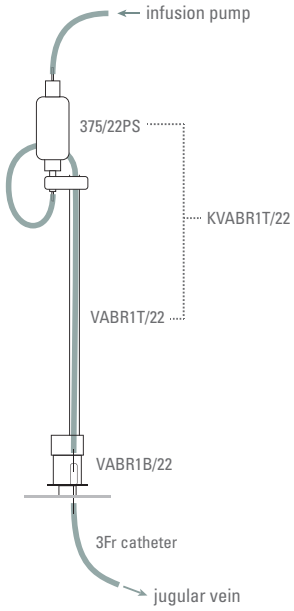
RAT INFUSION

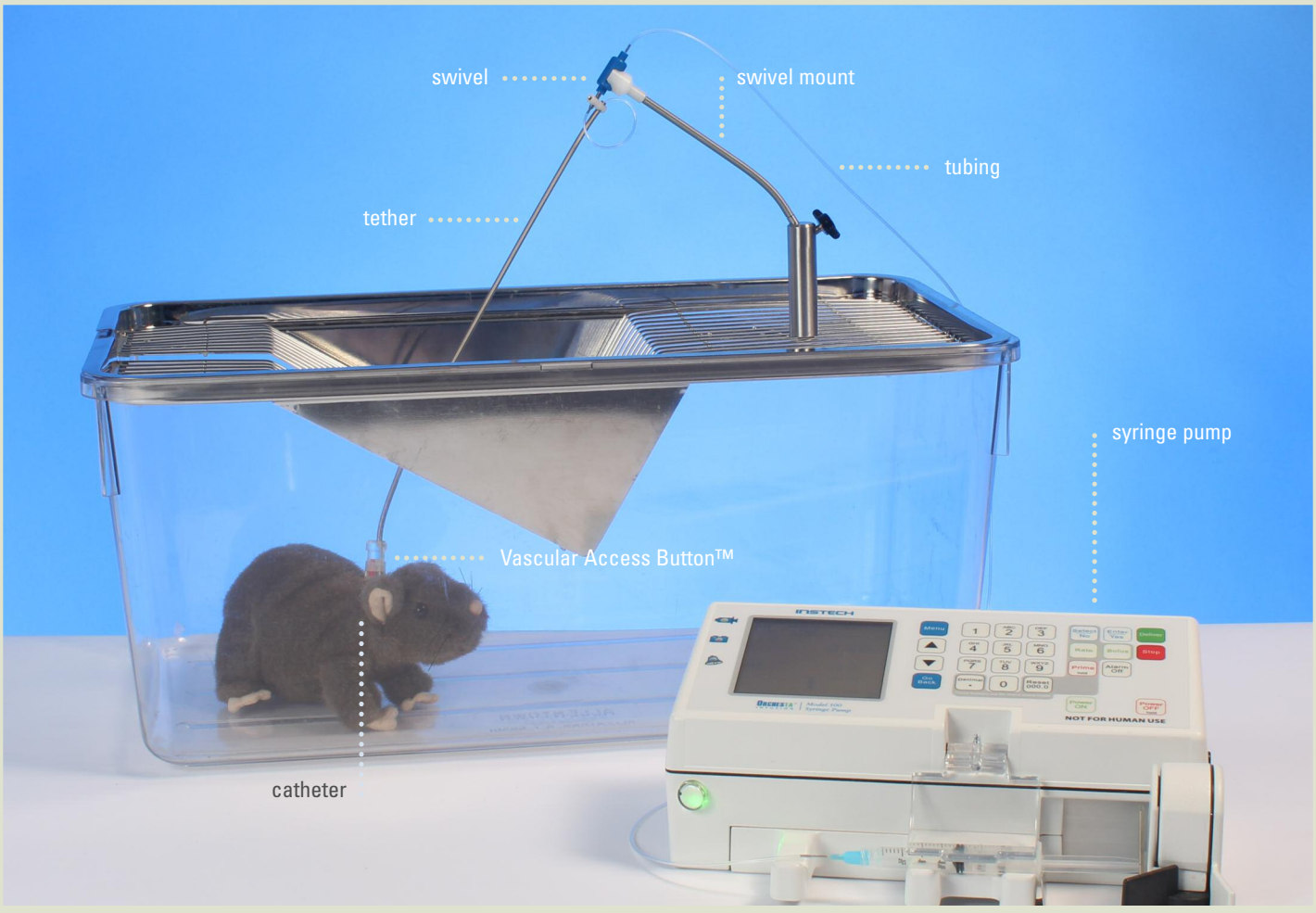
Continuous intravenous infusion of rats is the most common application of Instech's equipment. A basic system includes a catheter, exteriorization device, tether, swivel, swivel-to-cage mount and infusion pump.

You have several options with a rat system: reusable or disposable components, tethers that attach to a harness worn by the rat or to a button that is surgically implanted, and a range of catheters depending on the vessel or organ you need to access.

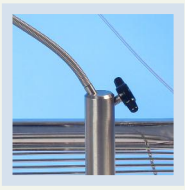
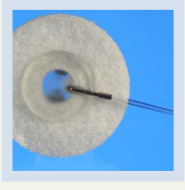
Use a Harvard Apparatus 11 Elite syringe pump for most basic experiments; for GLP studies use the advanced OrchesTA™ model 100 syringe pump.

www.instechlabs.com/Infusion/systems/single.php

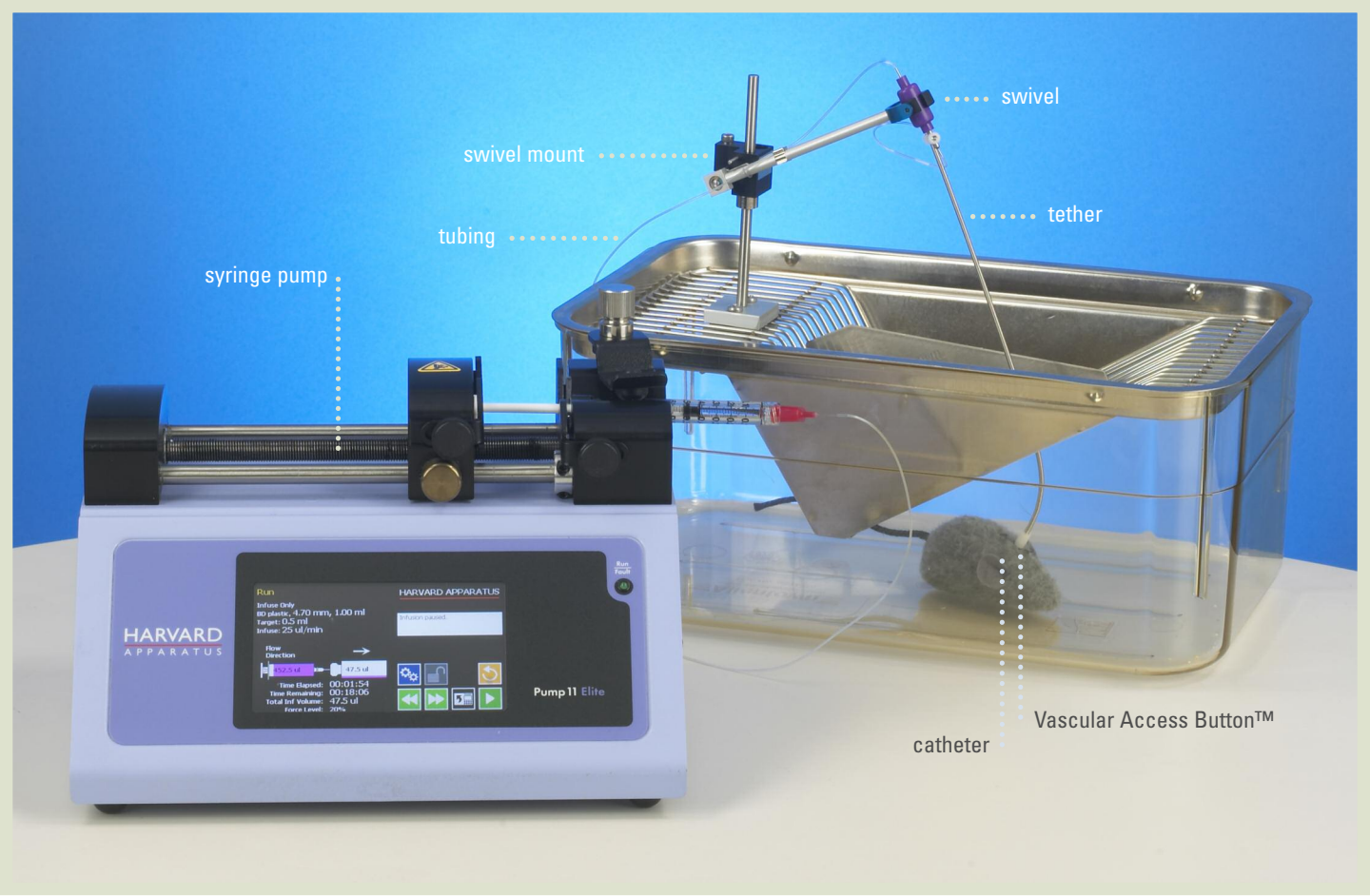




SYSTEM COMPONENTS

	AS SHOWN	ALTERNATIVES
PUMP	 OR-100-0001 (p54) OrchesTA syringe pump	 HA1100 (p56) Harvard Apparatus pump
SWIVEL	 375/22PS (p39) Plastic swivel, 1ch, 22ga	 375/22 (p40) Stainless steel swivel, 1ch, 22ga
SWIVEL MOUNT	 CM375KRP (p45) Spring balanced mount	 CM375BS (p45) Counter-balanced mount
TETHER	 VABR1T/22 (p28) Vascular Access Button tether VABR1B/22 Vascular Access Button, 1ch, 22ga	 VAH95T (p31) Vascular Access Harness tether VAH95AB Vascular Access Harness, 1ch
CATHETER (many other options available)	 C30PU-RJV1303 (p21) Rat JVC, 3Fr	 C30PU-RFV1308 (p21) Rat FVC, 3Fr

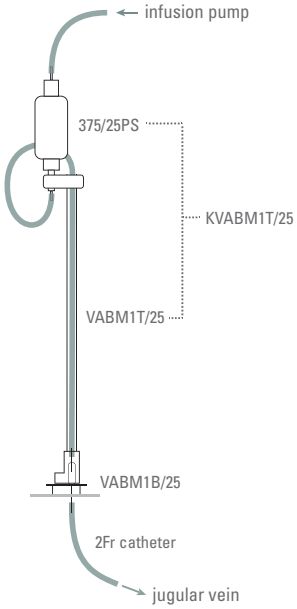
MOUSE INFUSION



Choose your equipment carefully when setting up continuous mouse infusion studies. A typical mouse can turn a swivel with no more than 0.025oz-in of frictional torque. Instech has three models that meet this specification: a 25ga stainless steel model, a 25ga plastic model, and the 375/D/22LT dual channel model. Always use a spring counter-balanced lever arm to remove the weight of the tether from the mouse.

Instech's mouse catheters are designed for mouse anatomy on one end and, on the other, to connect to a Vascular Access Button™ for reliable exteriorization and simple connection to a tether, swivel and syringe pump.

www.instechlabs.com/Infusion/systems/singlemice.php



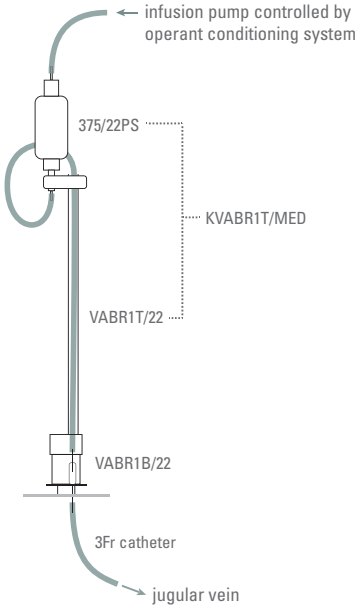
SYSTEM COMPONENTS

	AS SHOWN	ALTERNATIVES
PUMP		
	HA1100 (p56) Harvard Apparatus pump	OR-100-0001 (p54) OrchesTA syringe pump
SWIVEL		
	375/25PS (p39) Plastic swivel, 1ch, 25ga	375/25 (p40) Stainless steel swivel, 1ch, 25ga
SWIVEL MOUNT		
	SMCLA (p46) Counter-balanced lever arm	
TETHER		
	VABM1T/25 (p33) Vascular Access Button tether VABM1B/25 Vascular Access Button, 1ch, 25ga	VABM1T/25 (p33) Vascular Access Button tether VABM1B/22 Vascular Access Button, 1ch, 22ga
CATHETER (many other options available)		
	C20PU-MJV1617 (p23) Mouse JVC, 2Fr	C10PU-MFV1301 (p23) Mouse FVC, 1-3Fr

IV SELF ADMINISTRATION

Rat

Operant chambers shown are courtesy of Med Associates, Inc.



Instech swivels, tethers and balance arms are used with operant behavior systems for IV self administration studies. A lever press or nose poke will trigger an IV dose from a syringe pump.

Instech's Vascular Access Buttons were originally developed for self-administration studies because of long-term patency and the simplicity of moving animals into and out of the operant chamber.

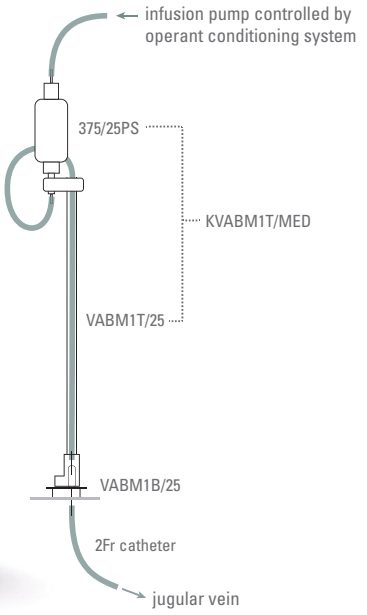
www.instechlabs.com/Infusion/systems/selfadministration-rat.php

www.instechlabs.com/Infusion/systems/selfadministration-mouse.php

Connection Options for IV Self Administration

	RAT	MOUSE
BUTTON	 VABR1B/22 - quick connecting - closed system - group housing possible	 VABM1B/25 - quick connecting - closed system - group housing possible
HARNESS	 VAH95AB - quick connecting - closed system	

Mouse



IV SELF-ADMINISTRATION SYSTEMS

		COMPATIBLE INSTECH EQUIPMENT	
MANUFACTURER	OPERANT CHAMBER*	MOUNT (p46)	SWIVEL & TETHER (p27, 39)
Med Associates, Inc. St. Albans VT, USA www.med-associates.com	MED-008-CT-B1 Basic rat self administration test package	MCLA/MED	KVABR1T/MED, VABR1B/22
	MED-307A-CT-B1 Basic mouse self administration test package	SMCLA/MED	KVABM1T/MED, VABM1B/25
TSE Systems GmbH Bad Homburg, Germany www.tse-systems.com	PhenoMaster Behavior Operant behavior home cage monitoring system - for rats - for mice	 CM375BS SMCLA	 375/22, VABR1T/22, VABR1B/22 375/25, VABM1B/25, VABM1T/25
Coulbourn Instruments Whitehall PA, USA www.coulbourn.com	Habitest Modular Test Cages - for rats - for mice	 MCLA/COUL SMCLA/COUL	 KVABR1T/MED, VABR1B/22 KVABM1T/MED, VABM1B/25
Panlab, S.L. Barcelona, Spain www.panlab.com	Modular Self Administration Boxes		

* Operant chamber system information provided for reference only. Order directly from the manufacturer.

BLOOD SAMPLING

Instech offers a range of equipment for laboratory animal blood sampling, from manual sampling from a catheter using the revolutionary PinPort™ to hands-free automated sampling through a tether with the ABS2™.

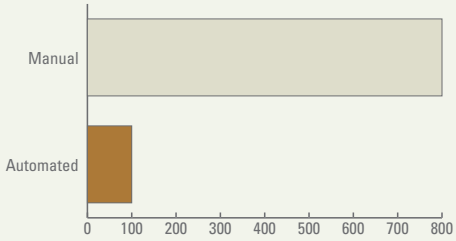
Catheters will lose patency for blood sampling more quickly than they will for infusion. For best results use round-tip polyurethane catheters, be sure the catheter tip is in the correct location in the vessel, use a good lock solution, flush as needed but not too often (typically weekly is ideal), always use positive pressure technique, and use a closed-system such a PinPort or Vascular Access Button to avoid contamination.

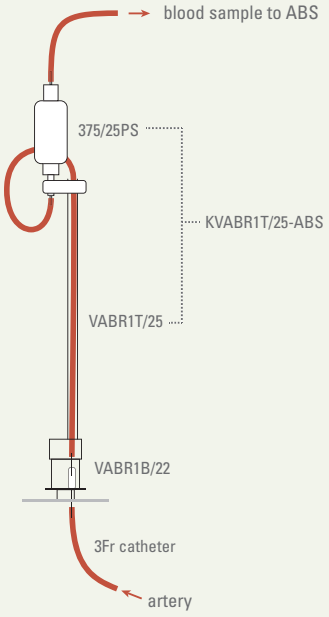
Rat, Automated Sampling

automated blood sampler (p61)

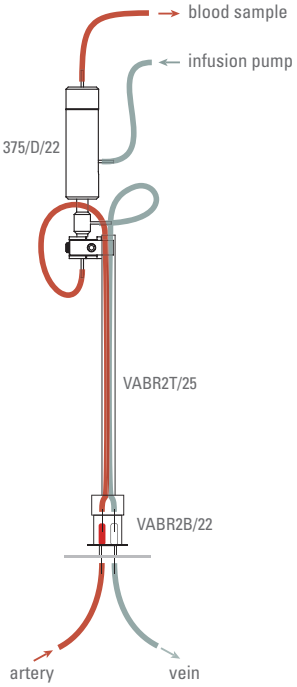
LOWER STRESS
adrenaline (pg/ml), rats

3Rs





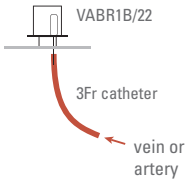
Rat, Sampling + Infusion



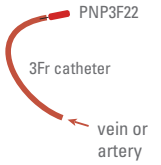
375/D/22 (p41)
2 channel swivel

VABR2B/22 (p29)
Vascular Access Button (2ch)

Rat, Manual Sampling



VABR1B/22 (p28)
Vascular Access Button, 1ch

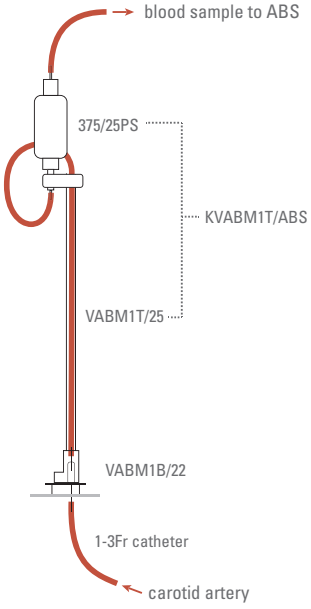


PNP3F22 (p24)
PinPort, 22ga

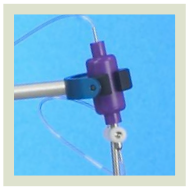
C15SS-RTV1438P (p22)
Rat tail vein cannula, 25ga

www.instechlabs.com/Infusion/systems/bloodsampling-rat.php

Mouse, Automated Sampling



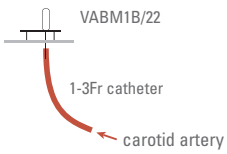
ABS2 (p61)
Automated blood sampler



375/25PS (p39)
1 channel swivel, 25ga

VABM1B/22 (p33)
Vascular Access Button, 22ga

Mouse, Manual Sampling



VABM1B/22 (p33)
Vascular Access Button, 22ga

C10SS-MTV1429P (p23)
Mouse tail vein cannula, 29ga

www.instechlabs.com/Infusion/systems/bloodsampling-mouse.php

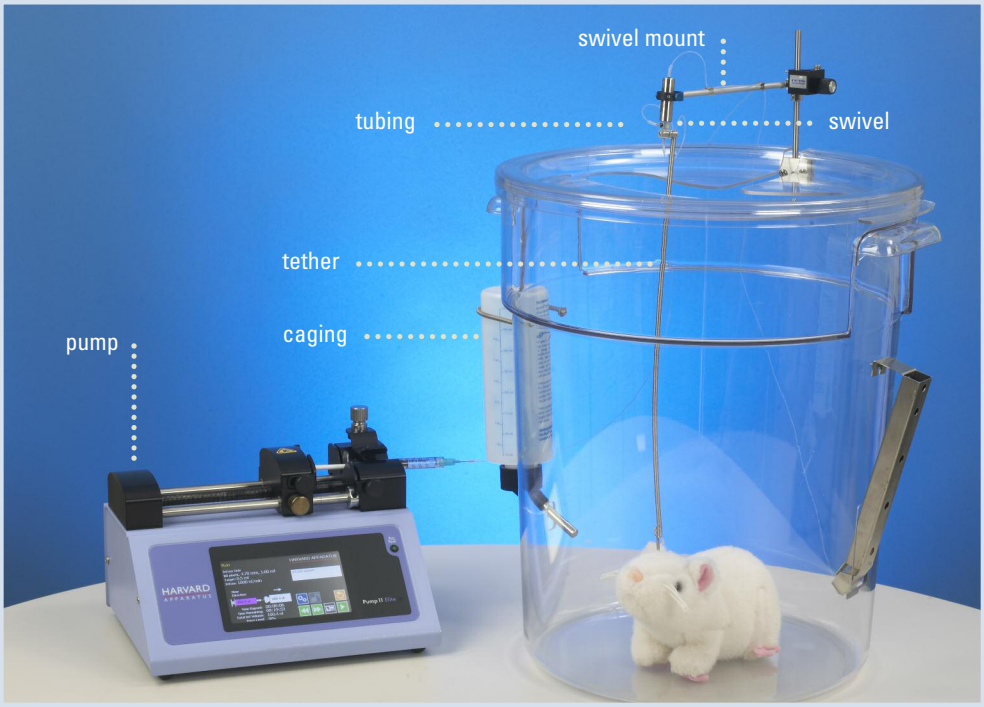
MICRODIALYSIS

Instech provides the liquid swivels, head block tethers, counter-balanced lever arms and syringe pumps that have made microdialysis on awake rodents possible from the earliest days of the technique.

The Harvard Apparatus Pico Plus Elite syringe pump delivers the smooth low-flow rates required for microdialysis.

These systems are compatible with probes, fraction collectors and other equipment from a range of manufacturers.

Rat



PUMP

HA1100DU (p56)
Harvard Pico Plus Elite

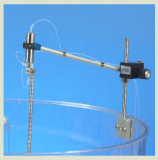
SWIVEL

375/D/22QM (p41)
Microdialysis swivel

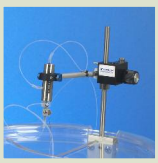
375/D/22QE (p41)
Microdialysis swivel

MCS/5A (p43)
5 channel swivel

SWIVEL MOUNT



MCLA (p46)
Lever arm, 6in



SMCLA (p46)
Lever arm, 3.5in

TETHER

M115S (p37)
Rat head block tether

MINF (p37)
Mouse head block tether

TUBING

BFEP-T22Q (p49)
FEP tubing

MC015/10 (p49)
Tubing connectors

OTHER

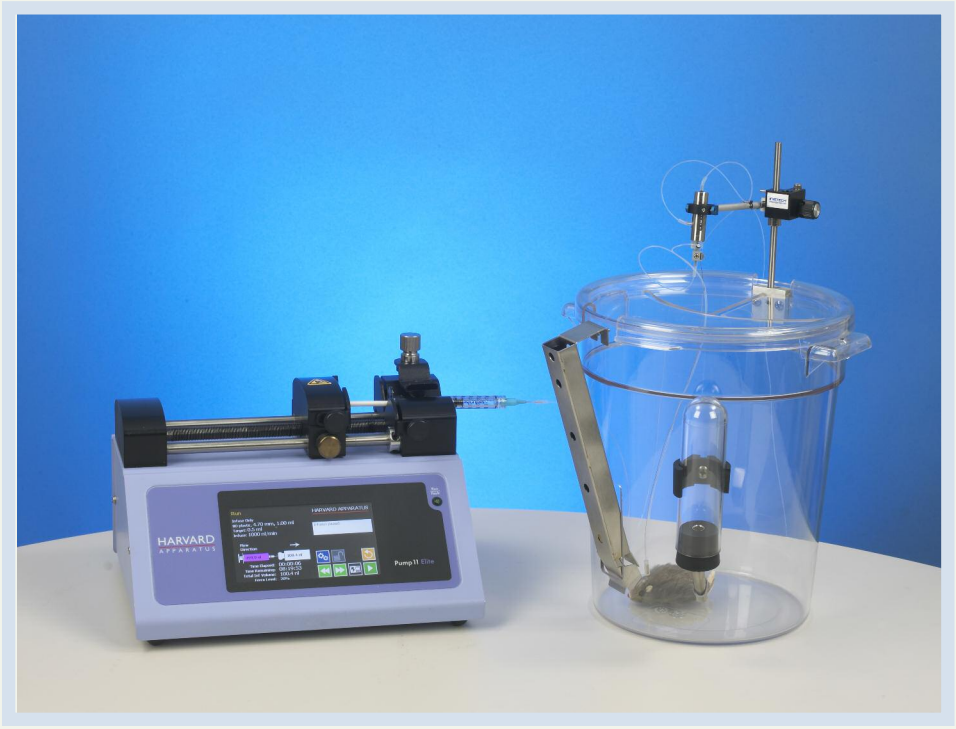
MGIG/AKIT (p37)
Glass ionomer cement

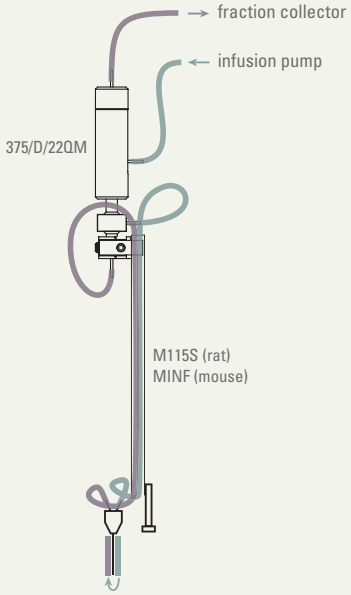
MTANK (p47)
Enclosure, 15in

STANK (p347)
Enclosure, 8.5in

www.instechlabs.com/Infusion/systems/microdialysisrats.php
www.instechlabs.com/Infusion/systems/microdialysismice.php

Mouse





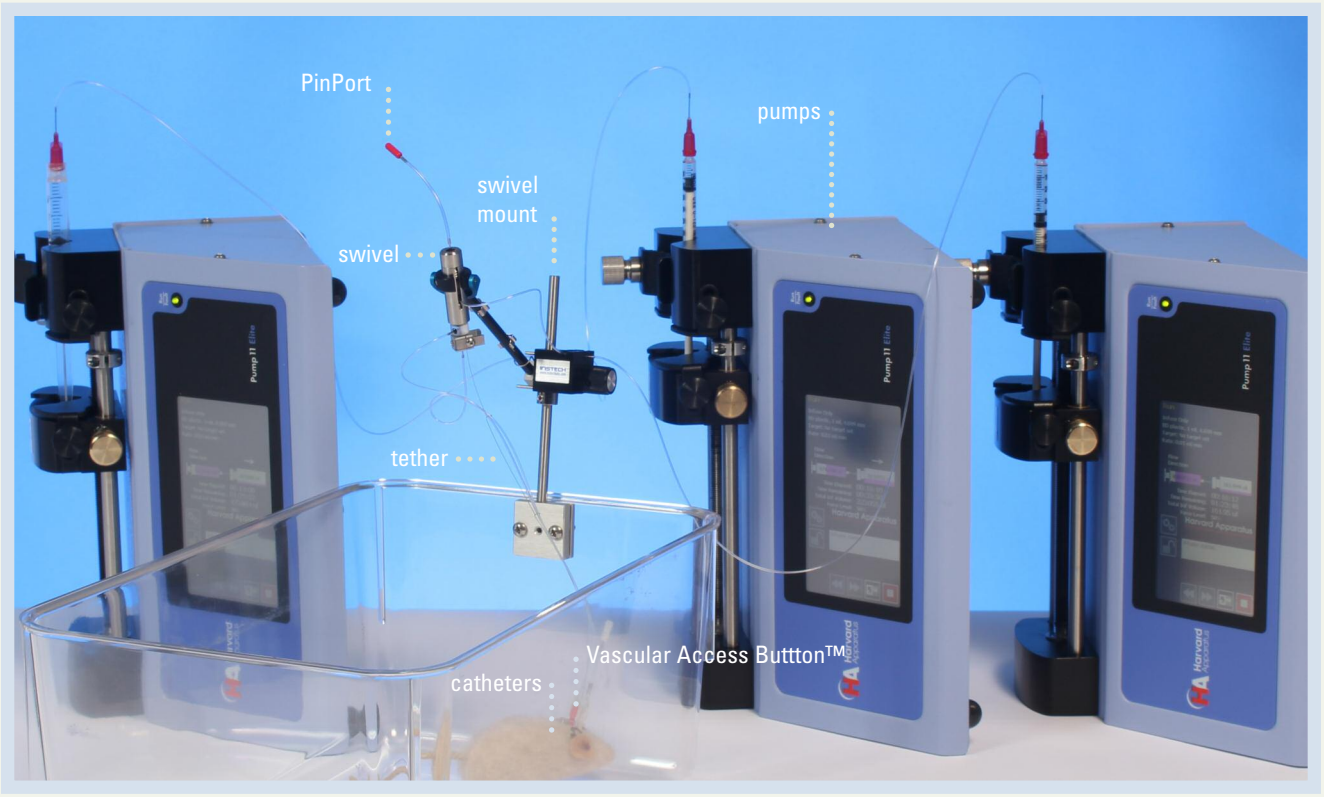
Sources for Microdialysis Probes

Manufacturer	Model	Application	Membrane	Cutoff (kD)	OD (mm)
CMA Microdialysis AB Solna, Sweden www.microdialysis.se	CMA 12 CMA 11 CMA 7	regular CNS use small diameter probe mice	PAES or PES cuprophane cuprophane	20 or 100 6 6	0.5 0.24 0.24
Microbiotech/se AB Stockholm, Sweden www.microbiotech.se	MAB 2 MAB 6 MAB 9 MAB 4Cu MAB 4PES	regular CNS use CNS CNS small diameter probe small diameter probe	PES PES PES cuprophane PES	35 15 6 6 6	0.6 0.6 0.6 0.2 0.2
Bioanalytical Systems West Lafayette, IN, USA www.basinc.com	BR-2 MBR-1-5	regular CNS use mice	PAN cellulosic	30 38	0.32 0.22
Brainlink B.V. Groningen, The Netherlands www.brainlink.nl	Normal MetaQuant	regular CNS use ultraslow MD, PK/PD	PAN or RC PAN or RC	45 or 18 45 or 18	0.34 or 0.22 0.34 or 0.22
Synaptech Marquette, MI USA www.synaptechnology.com	S-8020	regular CNS use	PAN	20	0.36

Note: this information is provided for reference only. Instech does not supply probes. Order directly from the manufacturer.
Probe images courtesy of the listed manufacturer.

GLUCOSE CLAMP

Hyperinsulinemic-Euglycemic Clamp, Mouse



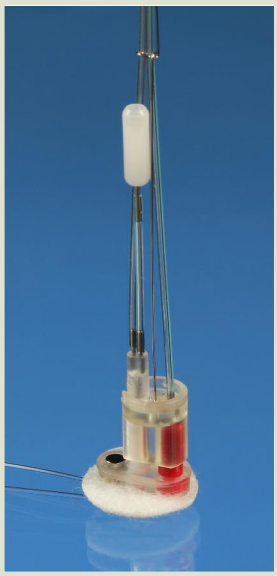
The hyperinsulinemic-euglycemic clamp is considered the gold standard method for assessing insulin action in vivo. Conducting these experiments on freely-moving rodents, particularly mice, can be difficult, not least due to the jugular vein and carotid artery catheterization surgery.

Instech now offers complete systems for mice and rats, starting with the catheters that connect to two-channel Vascular Access Buttons, special tethers with 3- and 4-way connectors, up to the infusion pumps that control delivery of insulin, glucose, red blood cells and other infusates.

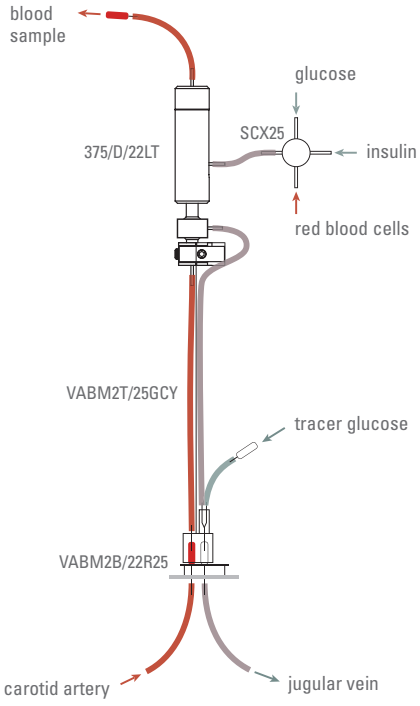
The mouse system is based on the techniques developed and taught by the Vanderbilt MMPC. The two-channel VAB is Instech's version of the researcher-constructed MASA™, simplifying connection and permitting group housing when not on study.

www.instechlabs.com/Infusion/systems/glucoseclampmice.php

MASA is a trademark of the Vanderbilt MMPC. https://labnodes.vanderbilt.edu/mmpc

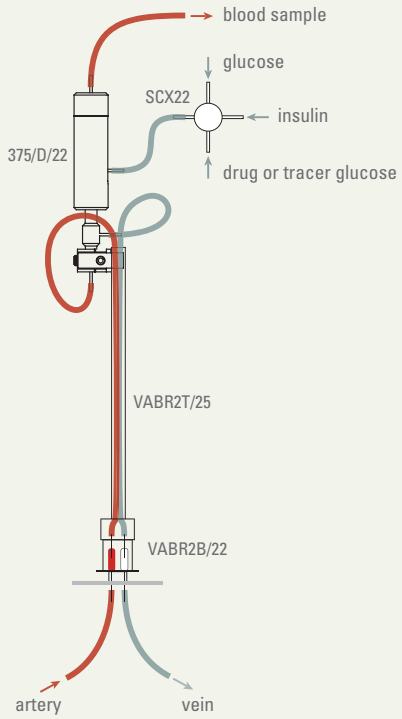


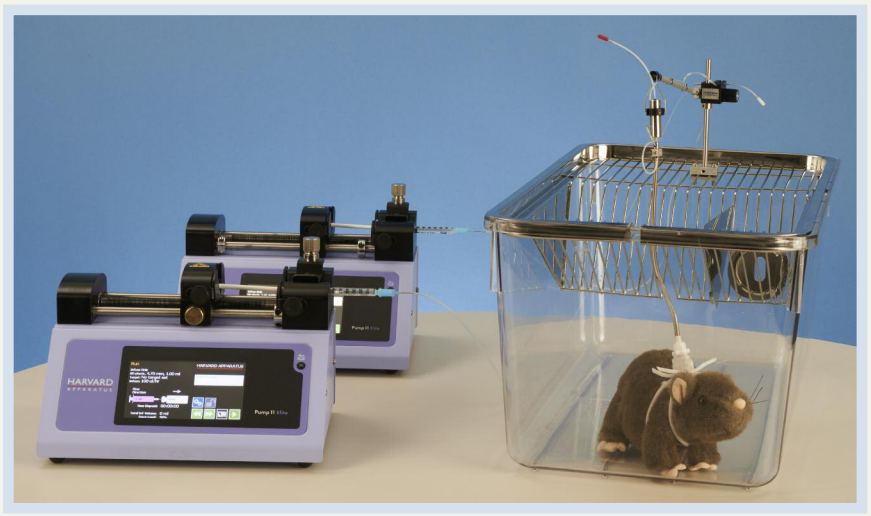
VABM2T/25GCY NEW
VABM2B/22R25 (p34)
2ch Vascular Access Button with Glucose Clamp Tether



GLUCOSE CLAMP

Hyperinsulinemic-Euglycemic Clamp, Rat





SCX22 (p51)
4-way connector

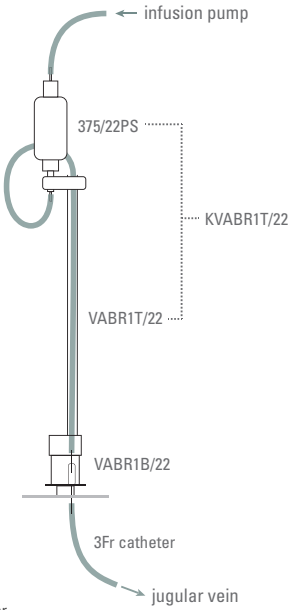
MCLA/GC (p46)
Swivel arm with pocket
for 4-way connector

VABR2T/25 (p29)
VABR2B/22
2ch Vascular Access Button

www.instechlabs.com/Infusion/systems/glucoseclamprats.php

WHOLE BODY PLETHYSMOGRAPHY

Photo of FinePointe WBP chamber
courtesy of Data Sciences International

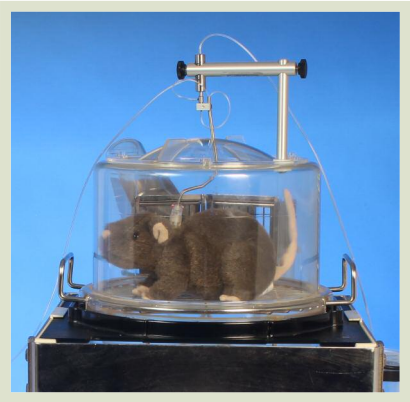


Instech's swivel and tether systems can be integrated into whole body plethysmography chambers to combine measurement of respiratory function with infusion or blood sampling.

The swivel is held in an o-ring seal at the top of the chamber. Tether lengths should be optimized for the height of the chamber. The Vascular Access Button™ and Harness systems make it easy to move an animal into and out of the chamber.

www.instechlabs.com/Infusion/systems/wbp.php

BILE COLLECTION



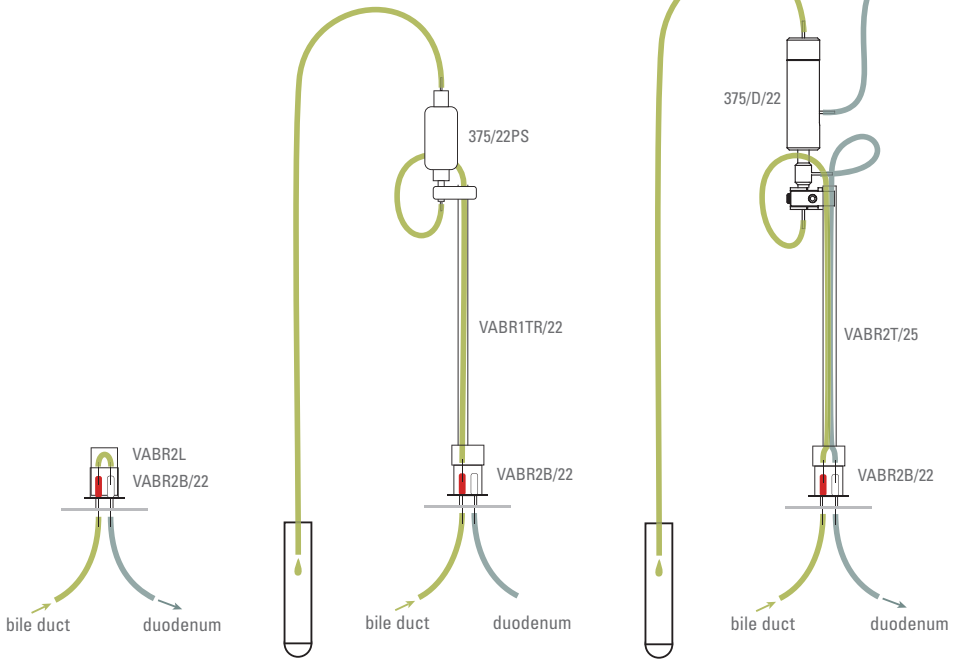
Instech's two channel Vascular Access Buttons and Harnesses have simplified and refined rat bile collection. Catheters in the bile duct and duodenum are connected to the ports of the button or harness so that bile can flow in an extra-corporeal loop while the animal is recovering from surgery and in transport. To start sampling, simply remove the loop connector, plug in a mating tether with a swivel, and collect bile outside the cage at animal level.

Additional configurations are available for simultaneous infusion or blood sampling, and a similar system is available for mice. Many animal vendors can perform the catheterizations and install the button or harness with loop as a surgical service.

VABR2B/22 (p29)
VABR2L
2-channel button
with loop connector

VAHD115AB (p32)
VAHD115L
2-channel harness
with loop connector

2 Channels

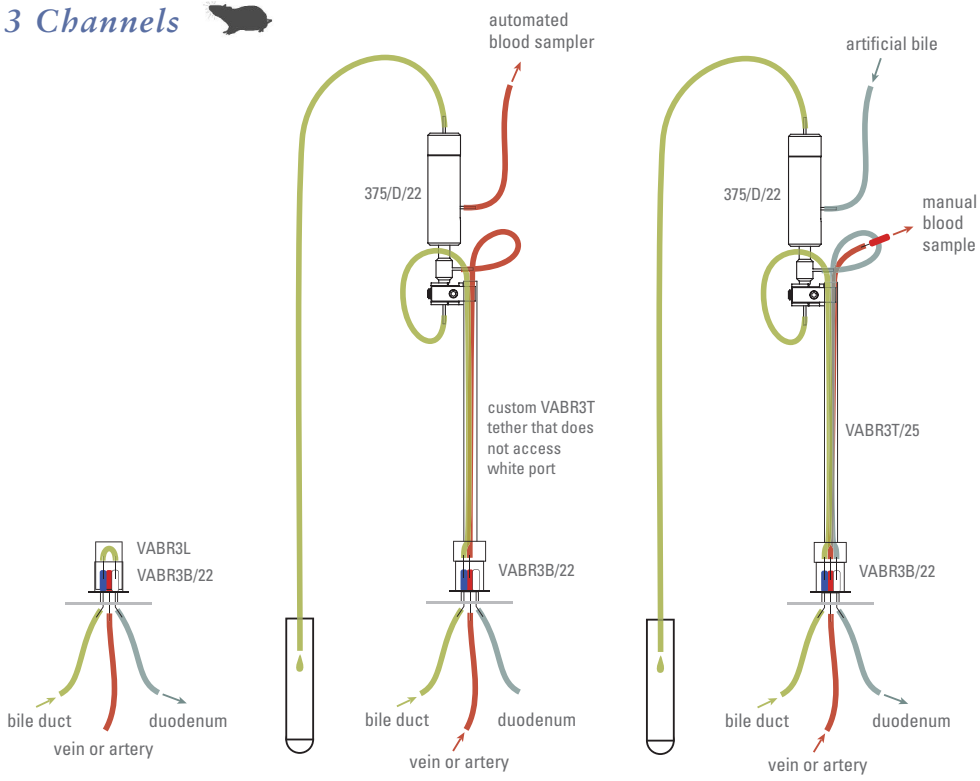


A.1. Bile circulating

A.2. Bile sampling, no replacement

A.3. Bile sampling, with replacement

3 Channels



B.1. Bile circulating

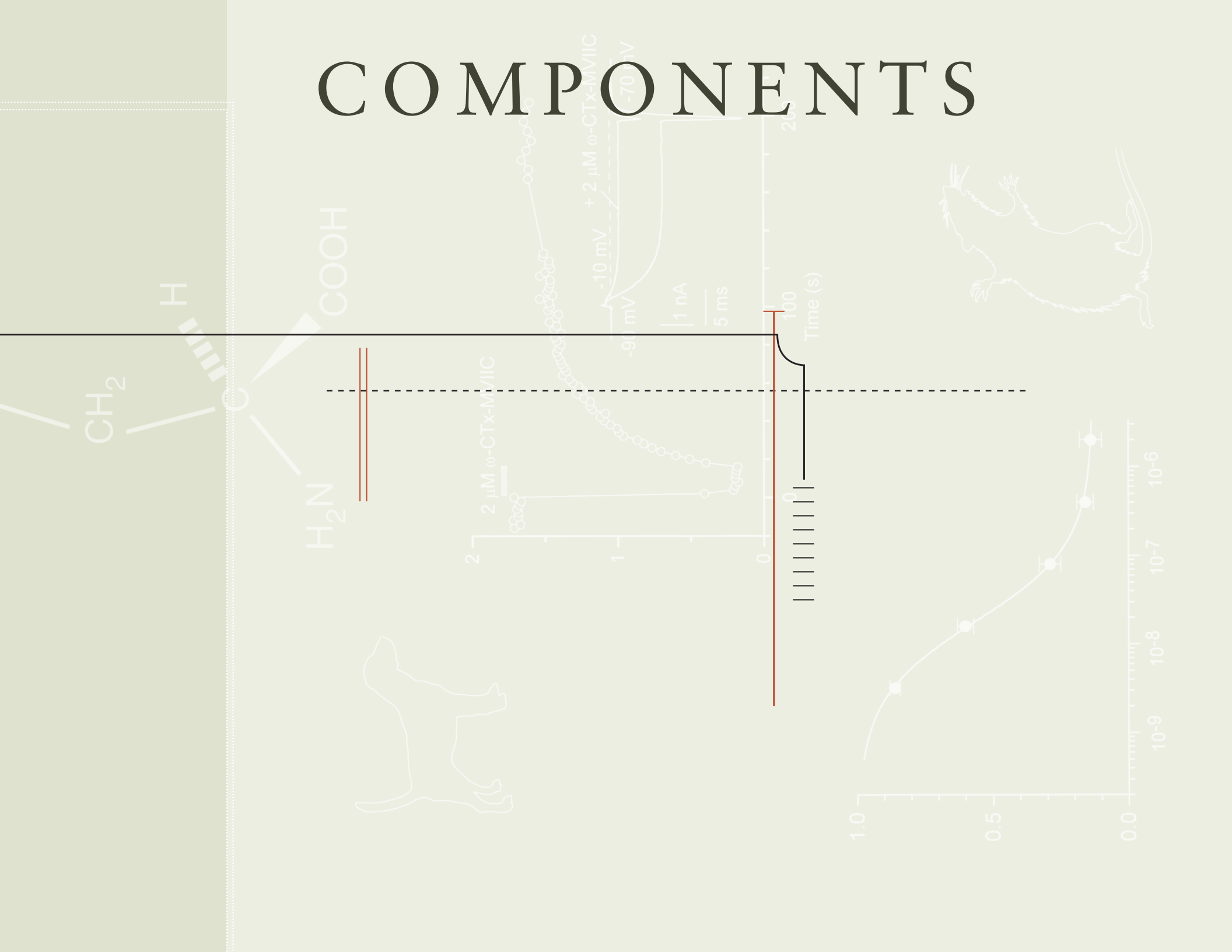
B.2. Bile sampling, no replacement, automated blood sampling

B.3. Bile sampling, with replacement, manual blood sampling

www.instechlabs.com/Infusion/systems/ratbilecollection.php

www.instechlabs.com/Infusion/systems/mousebilecollection.php

COMPONENTS

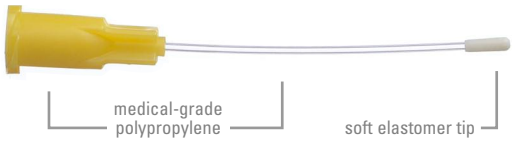

H
COOH
CH_2
O
H_2N
+ 2 µM ω-CTx-MVIIC
-10 mV
-70 mV
-60 mV
1 nA
5 ms
100
Time (s)
2 µM ω-CTx-MVIIC
2
1
0
10-6
10-7
10-8
10-9
1.0
0.5
0.0

RODENT FEEDING TUBES

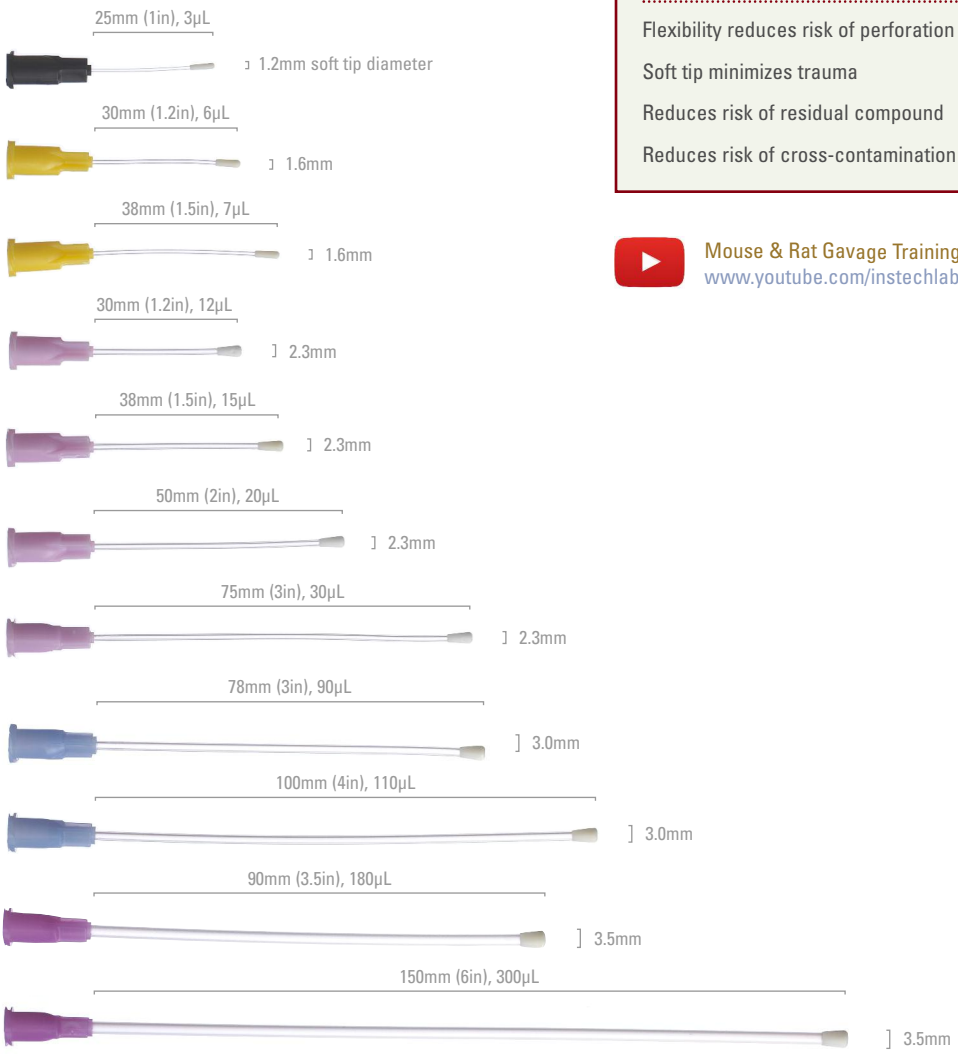
Polypropylene Feeding Tubes

Instech's plastic feeding needles are flexible to reduce trauma, and disposable to eliminate the cost of cleaning and the possibility of compound crossover. Flexible tubes are recommended as an animal-welfare refinement over traditional rigid metal tubes.[1]

The soft, bulb-shaped tip is designed to reduce the chances of inadvertent placement in the trachea and perforation of the esophagus. The tube and luer hub are made of polypropylene, the same material used to make clinical plastic syringes.



		PN: 250 pc box (PN: 50 pc box)	Tube size (IDxOD)
MOUSE	pup	FTP-22-25 (FTP-22-25-50)	22ga (0.4x0.7mm)
MOUSE	adult	FTP-20-30 (FTP-20-30-50)	20ga (0.5x0.9mm)
MOUSE	adult	FTP-20-38 (FTP-20-38-50)	20ga (0.5x0.9mm)
RAT	pup	FTP-18-30 (FTP-18-30-50)	18ga (0.7x1.2mm)
RAT	100-200gm	FTP-18-38 (FTP-18-38-50)	18ga (0.7x1.2mm)
RAT	200-300gm	FTP-18-50 (FTP-18-50-50)	18ga (0.7x1.2mm)
RAT	200-300gm	FTP-18-75 (FTP-18-75-50)	18ga (0.7x1.2mm)
RAT	300+gm	FTP-15-78 (FTP-15-78-50)	15ga (1.2x1.8mm)
RAT	300+gm	FTP-15-100 (FTP-15-100-50)	15ga (1.2x1.8mm)
GUINEA PIG, HAMSTER, RABBIT		FTP-13-90 (FTP-13-90-50)	13ga (1.6x2.4mm)
GUINEA PIG, HAMSTER, RABBIT		FTP-13-150 (FTP-13-150-50)	13ga (1.6x2.4mm)



BENEFITS ✓3Rs

- Flexibility reduces risk of perforation
- Soft tip minimizes trauma
- Reduces risk of residual compound
- Reduces risk of cross-contamination

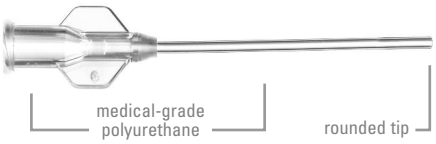
Mouse & Rat Gavage Training Videos
www.youtube.com/instechlabs

$ www.instechlabs.com/Infusion/feedingtubes/plastic.php

Sold sterile in pouches of 5 (10 or 50 per box). Species suggestions are not definitive but rather have been compiled based on published papers and anecdotal reports; try a variety of sizes to determine what works best for your application. Restraint and dosing technique is critical when using feeding tubes; see training videos for assistance. Dead volumes are approximate, ±20%, and do not include luer hub volume, a variable amount of which will be taken up by the syringe tip.

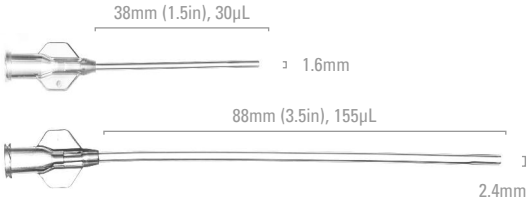
[1] "Refining procedures for the administration of substances." Report of the BVAAWF/FRAME/RSPCA/UFAW Joint Working Group on Refinement. Laboratory Animals (2001) 35, 1-41.

Polyurethane Feeding Tubes



These tubes feature a larger inner diameter for easier delivery of viscous compounds and a straight tube that wipes clean to help in cases where aspiration of compounds would be hazardous to the animal.

	PN: 250 pc box (PN: 50 pc box)	Tube size (IDxOD)
MOUSE	FTPU-16-38 (FTPU-16-38-50)	16ga (1.0x1.6mm)
RAT	FTPU-13-88 (FTPU-13-88-50)	13ga (1.5x2.4mm)
RAT	FTPU-13-380 (FTPU-13-380-50)	13ga (1.5x2.4mm)



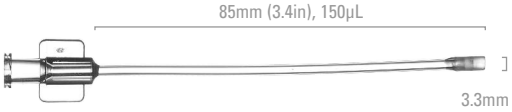
$ www.instechlabs.com/Infusion/feedingtubes/polyurethane.php

Long PU feeding tube for the "Harrogate tube" technique where the base of the tube is wrapped around the palm. Ideal for dosing large rats in chronic toxicity studies. Depth markings and the ability to see the compound through the tube are improvements over rubber human enteral feeding tubes.

#9 Capsule Doser

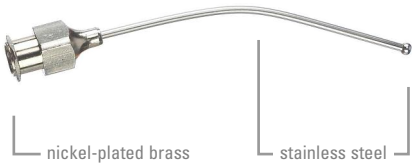
Designed to administer size 9 gelatin capsules made Torpac to rats, these flexible tubes can reduce the chance of trauma compared to rigid metal dosers. Expel the capsule with air, water or saline.

	PN: 20 pc box	Tube size (IDxOD)
RAT	FTPU-C9-85	13ga (1.5x2.4mm)



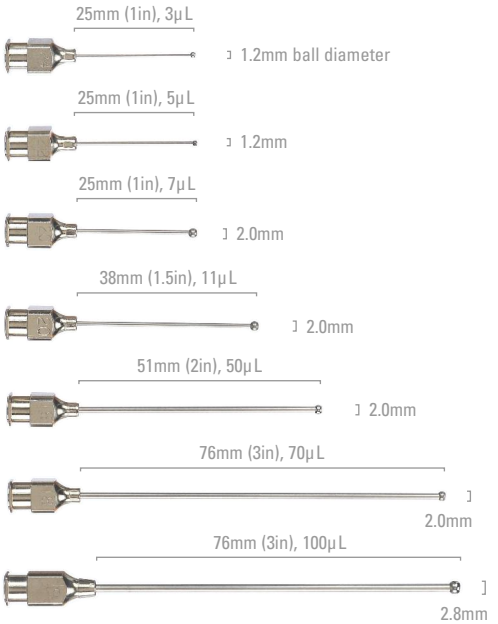
$ www.instechlabs.com/Infusion/feedingtubes/size9capsuledoser.php

Stainless Steel Feeding Tubes



These traditional reusable gavage needles feature stainless steel tubes and ball tips. They are sold straight but can be bent to your desired curve for optimal placement. Instech sterilizes them so that they arrive ready for use.

	PN: 6 pc pouch	Tube size (IDxOD)
MOUSE pup	FTSS-24S-25	24ga (0.4x0.6mm)
MOUSE adult	FTSS-22S-25	22ga (0.5x0.7mm)
MOUSE adult	FTSS-20S-25	20ga (0.6x0.9mm)
RAT 100-200gm	FTSS-20S-38	20ga (0.6x0.9mm)
RAT 100-200gm	FTSS-18S-51	18ga (1.1x1.3mm)
RAT 200-300gm	FTSS-18S-76	18ga (1.1x1.3mm)
RAT 200-300gm	FTSS-16S-76	16ga (1.3x1.7mm)



$ www.instechlabs.com/Infusion/feedingtubes/ftss.php

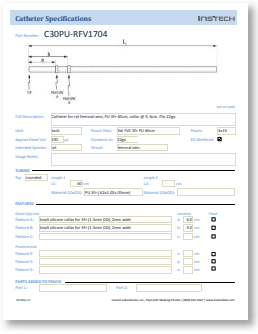
CATHETERS

Instech's rodent catheters are designed and manufactured in collaboration with ReCathCo, a leading supplier of catheters for laboratory animal research.

Instech and ReCathCo developed these catheters around three principles: first, that each model should be designed for the indicated species and vessel; second, that the catheter should have an ideal fit with the external device to which it will be attached; and, third, that customization should be simple enough that every researcher can afford to have the insertion lengths and features that match his or her surgical techniques.

These catheters are made of medical-grade tubing, assembled and packaged in a cleanroom and sterilized by ethylene-oxide gas.

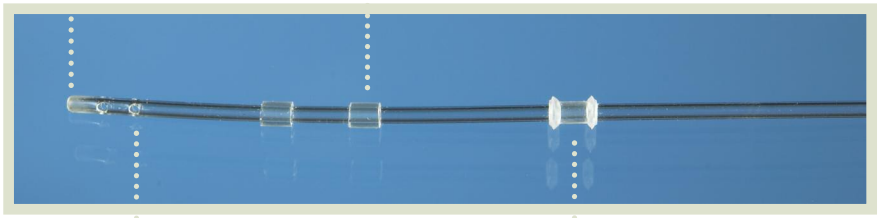
The catheter exteriorization method will impact longevity and usability. Instech Vascular Access Buttons for mice and rats offer improved patency and ease-of-use over simple exteriorized catheters for both tethered and intermittent access.



For detailed specification sheets, pricing, and additional catheter designs by application see www.instechlabs.com/Infusion/catheters

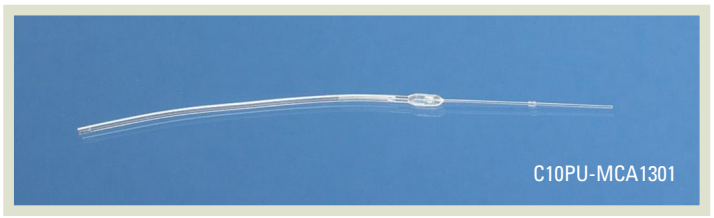
Rounded tips reduce trauma to vessel lining, which can improve patency compared to cut tubing.

Collars, or suture beads, near the distal tip hold the catheter in place in the vessel. Proper tip placement is critical for long-term patency.

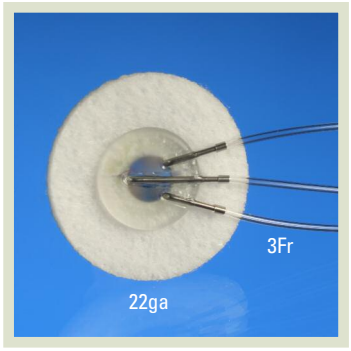


Perfusion holes are an option when the standard opening is likely to become obstructed.

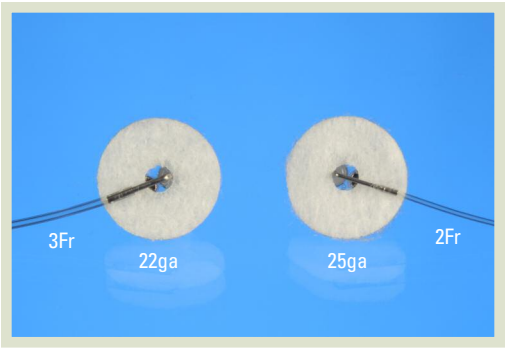
Spool collars are often used to hold the catheter in place where it exits the skin.



Two-piece catheters join small anatomy to practical connectors. The distal end can be as small as 1Fr (0.35mm) for mouse vessels or even 32ga (0.25mm) for intrathecal catheterization, while the proximal end fits 22ga or 25ga connectors.



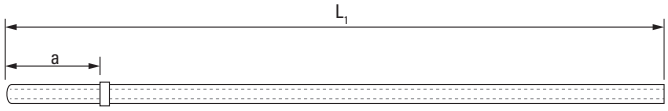
Instech rat catheters are made with 3Fr polyurethane tubing that has been extruded for an ideal fit with the 22ga connectors on Vascular Access Buttons, Harnesses and PinPorts.



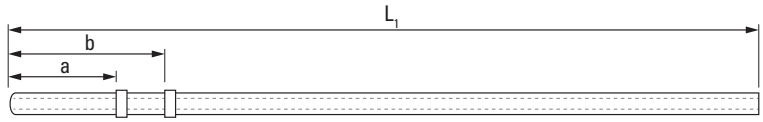
Instech mouse catheters are made with either 2Fr PU tubing with an inner diameter that is an ideal fit with 25ga, or a two-piece construction that transitions to 3Fr to fit 22ga. Mouse Vascular Access Buttons, the preferred method of exteriorization, have 22ga or 25ga connectors.

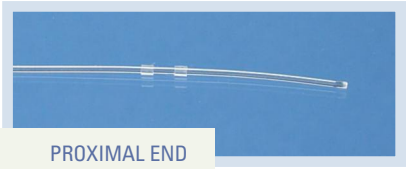
Selected Rat Catheters

Many other designs are available

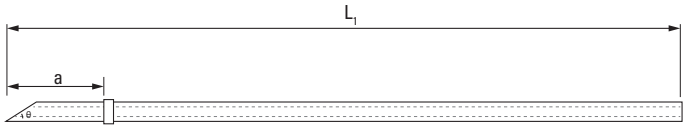


VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	PROXIMAL END
Jugular vein	C30PU-RJV1441	PU	3Fr (1mm)	round	22ga	20cm	2.0cm	
Jugular vein	C30PU-RJV1301	PU	3Fr (1mm)	round	22ga	14cm	2.5cm	
Jugular vein	C30PU-RJV1506	PU	3Fr (1mm)	round	22ga	15cm	2.6cm	spool collars
Jugular vein	C30PU-RJV1402	PU	3Fr (1mm)	round	22ga	15cm	3.0cm	
Jugular vein	C30PU-RJV1420	PU	3Fr (1mm)	round	22ga	10cm	3.0cm	sleeve
Jugular vein	C30PU-RJV1426	PU	3Fr (1mm)	round	22ga	12cm	3.8cm	
Jugular vein	C30PU-RJV1611	PU	3Fr (1mm)	round	22ga	20cm	3.8cm	
Femoral vein	C30PU-RFV1612	PU	3Fr (1mm)	round	22ga	20cm	4.5cm	
Carotid artery	C30PU-RCA1613	PU	3Fr (1mm)	round	22ga	20cm	2.5cm	

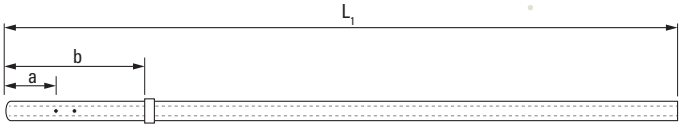




VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	b	PROXIMAL END
Jugular vein	C30PU-RJV1405	PU	3Fr (1mm)	round	22ga	20cm	2.5cm	2.8cm	
Jugular vein	C30PU-RJV1303	PU	3Fr (1mm)	round	22ga	30cm	2.5cm	3.0cm	
Jugular vein	C30PU-RJV1303P	PU	3Fr (1mm)	round	22ga	30cm	2.5cm	3.0cm	PinPort
Femoral vein	C30PU-RFV1308	PU	3Fr (1mm)	round	22ga	25cm	3.0cm	3.5cm	
Femoral vein	C30PU-RFV1313	PU	3Fr (1mm)	round	22ga	20cm	3.5cm	6.0cm	



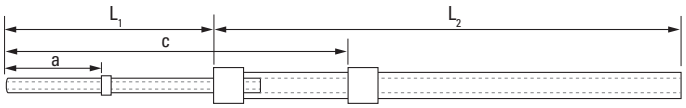
VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	b
Bile duct	C30PU-RBD1614	PU	3Fr (1mm)	beveled	22ga	20cm	0.7cm	-
Duodenum	C30PU-RDD1615	PU	3Fr (1mm)	square	22ga	20cm	0.9cm	1.2cm
Portal vein	C30PU-RPV1616	PU	3Fr (1mm)	round	22ga	20cm	0.2cm	0.7cm



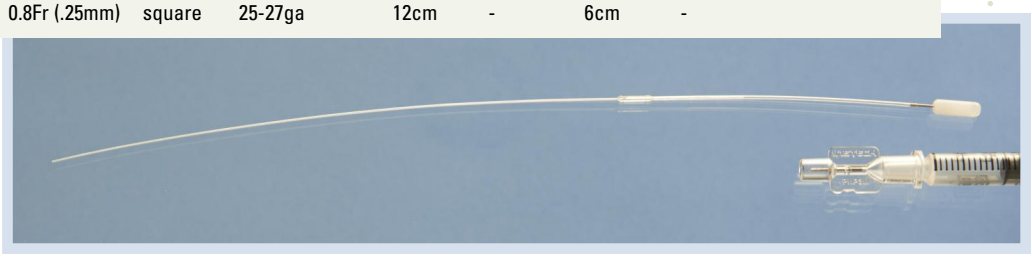
Compatible with surgical procedures taught by the René Remie Surgical Skills Centre www.rrssc.eu. These catheters include sterile luer stubs for priming during surgery.

CATHETERS

Selected Rat Catheters (continued)

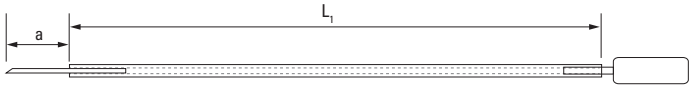


VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	L2	c	PROXIMAL END
Femoral vein	C19PU-RFV1406	PU	1.9Fr (.64mm)	round	22ga	4.5cm	-	25cm	7.5cm	
Femoral vein	C19PU-RFV1414	PU	1.9Fr (.64mm)	round	22ga	4.5cm	4.0cm	25cm	7.5cm	
Carotid artery	C19PU-RCA1301	PU	1.9Fr (.64mm)	round	22ga	3.5cm	-	13cm	8.0cm	
Carotid artery	C19PU-RCA1421	PU	1.9Fr (.64mm)	round	22ga	3.5cm	-	10cm	8.0cm	
Intrathecal	C08PU-RIT1430P	PU	0.8Fr (.25mm)	square	25-27ga	8cm	-	6cm	-	PinPort
Intrathecal	C08PU-RIT1301	PU	0.8Fr (.25mm)	square	25-27ga	12cm	-	6cm	-	

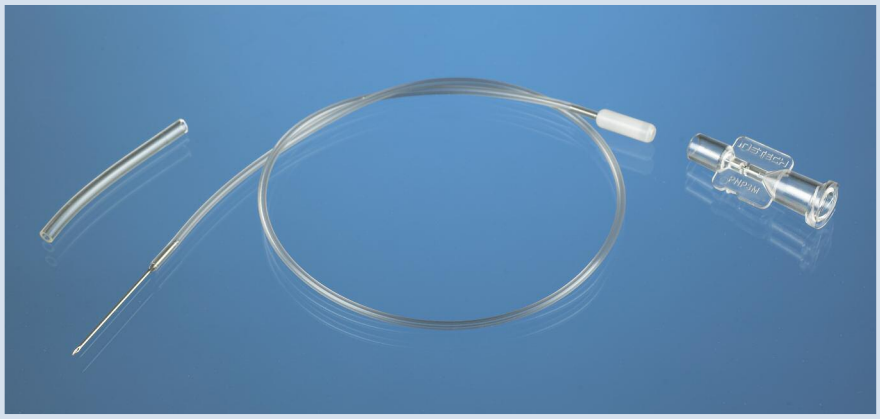


The 32ga (0.8Fr) rat intrathecal catheter mates with a 25ga PinPort to create a closed, low-volume system for infusion, or it can be combined with a 27ga Vascular Access Button (p28).

Rat Tail Vein Cannulae



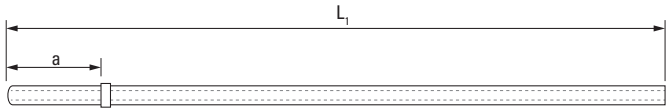
VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	PROXIMAL END
Tail vein	C15SS-RTV1438P	SS	25ga (.51mm)	sharp	syringe/PNP3M	25cm	2cm	PinPort
Tail vein	C15SS-RTV1453P	SS	25ga (.51mm)	sharp	syringe/PNP3M	6cm	2cm	PinPort



A rat tail vein cannula is a simple non-surgical option for one-time injections or blood samples. The sharp 25ga stainless steel hypodermic needle should not be left in place.

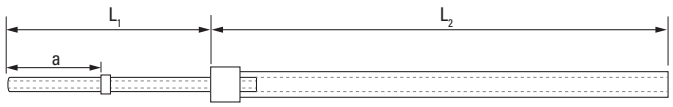
Selected Mouse Catheters

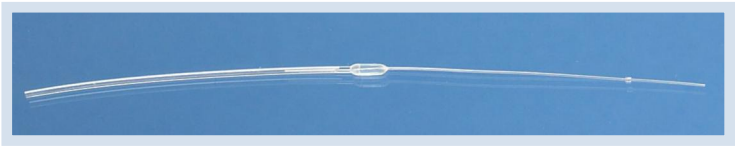
Many other designs are available



VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	
Jugular vein	C20PU-MJV1617	PU	2Fr (.69mm)	round	25ga	10cm	1.3cm	☡
Jugular vein	C20PU-MJV1410	PU	2Fr (.69mm)	round	25ga	6cm	1.3cm	
Jugular vein	C20PU-MJV1458	PU	2Fr (.69mm)	round	25ga	10cm	1.1cm	
Carotid artery	C20PU-MCA1618	PU	2Fr (.69mm)	round	25ga	10cm	1.0cm	☡
Carotid artery	C20PU-MCA1434	PU	2Fr (.69mm)	round	25ga	6cm	0.9cm	

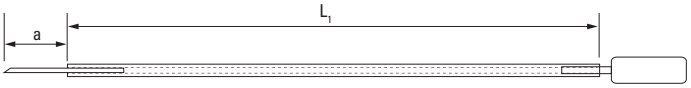
☡ Compatible with surgical procedures taught by the René Remie Surgical Skills Centre www.rrssc.eu. These catheters include sterile luer stubs for priming during surgery.





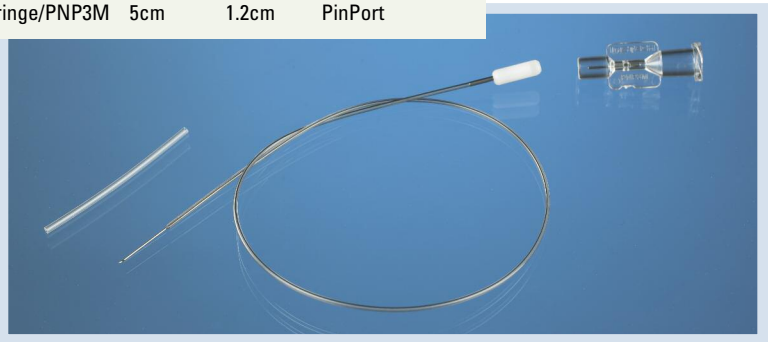
VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	L2
Carotid artery	C10PU-MCA1301	PU	1Fr (.35mm)	round	22ga	2.5cm	1.1cm	5.5cm
Carotid artery	C10PU-MCA1459	soft PU	1Fr (.35mm)	square	22ga	2.5cm	0.9cm	5.5cm
Jugular vein	C10PU-MJV1403	PU	1Fr (.35mm)	round	22ga	5.0cm	1.2cm	5.0cm
Femoral vein	C10PU-MFV1301	PU	1Fr (.35mm)	round	22ga	5.0cm	1.2cm	5.0cm

Mouse Tail Vein Cannulae



VESSEL	PART NUMBER	MATL	SIZE (OD)	TIP	CONNECTS TO	L1	a	PROXIMAL END
Tail vein	C10SS-MTV1301	SS	29ga (.33mm)	sharp	syringe	25cm	1.2cm	Female luer
Tail vein	C10SS-MTV1417P	SS	29ga (.33mm)	sharp	syringe/PNP3M	25cm	1.2cm	PinPort
Tail vein	C10SS-MTV1429P	SS	29ga (.33mm)	sharp	syringe/PNP3M	5cm	1.2cm	PinPort

The mouse tail vein cannula, for intermittent sampling or dosing of a restrained mouse, includes a 29ga sharp needle on one end of a flexible tube, with a PinPort or female luer on the other end for connecting a syringe.



PINPORTS™

Instech PinPorts™ provide fast, aseptic access to externalized laboratory animal catheters, tubing or cannulae for dosing or sampling. They can reduce study costs and improve compliance with the 3Rs. The system consists of a lightweight port, just 3mm in diameter, and a mating injector or connector which can access the port hundreds of times.

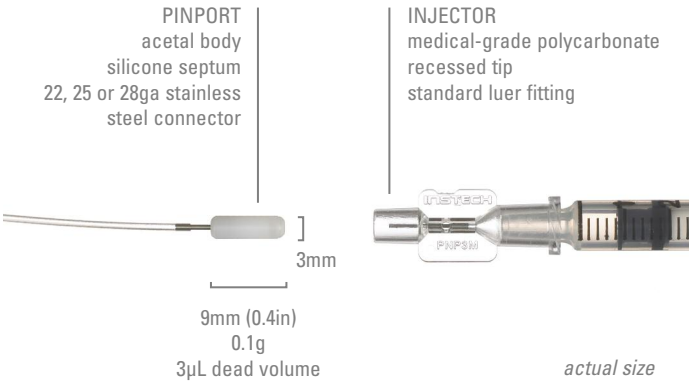
Quick. Infuse or withdraw from a catheter in a fraction of the time it takes with plugs and blunt needles.

Clean. The PinPort is a closed system that permits aseptic technique. This can reduce infection, improve patency and ultimately reduce the number of animals required for a study.

Safe. The injector is recessed and provides complete needle stick protection for personnel.

PinPort™ for Catheters and Tubing

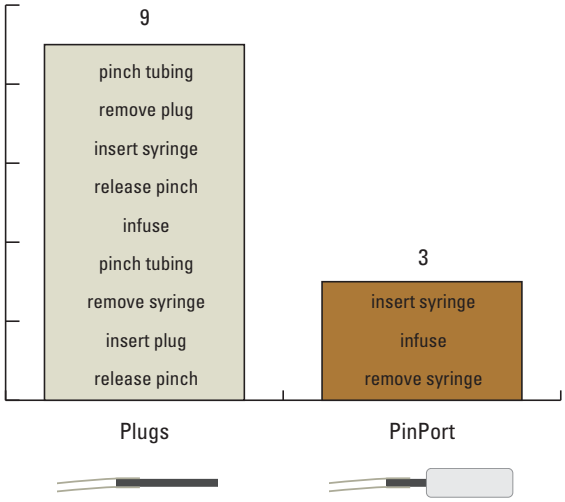
The standard PinPort™ is a smooth 3mm-diameter port with 22ga, 25ga or 28ga couplers. It is available in white, red or blue (22ga only); use colors to distinguish vessels.



Use a PinPort in place of stainless steel plugs to terminate externalized catheters, then access the catheter through the port using a syringe with a PinPort injector.

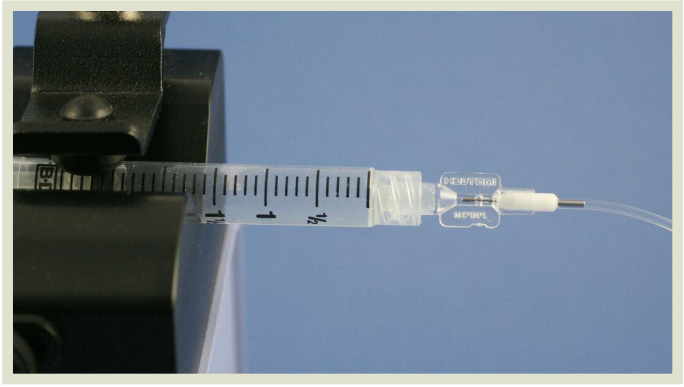
PinPort used for direct blood sampling from externalized rat catheter

NUMBER OF STEPS TO ACCESS CATHETER



Animals can be ordered from vendors with the PinPort installed at the time of catheterization. Envigo developed an effective method for anchoring the PinPort and achieved 90% of rat JVCs fully patent (for blood sampling as well as infusion) after one month, flushing only once per week.

PinPorts can also be used anywhere in an infusion set where frequent connections and disconnections occur, so long as that joint does not experience lateral forces strong enough to accidentally disengage the port during a study.



PinPort used to connect a syringe to an infusion set in an infusion toxicology study, making syringe changes simpler and cleaner

Both the ports and the injectors are available separately in boxes of 50 or 250, packaged 5 to a sterile pouch. Ports and injectors are also available as a set, packaged one set per pouch, 20 pouches per box. All parts are provided EtO sterilized.

PinPorts

Color Connector (ODxID)	250 pc box x 50	50 pc box x 10
White 22ga (.028x.016in)	PNP3F22	PNP3F22-50
Red 22ga (.028x.016in)	PNP3F22R	PNP3F22R-50
Blue 22ga (.028x.016in)	PNP3F22B	PNP3F22B-50
White 25ga (.020x.010in)	PNP3F25	PNP3F25-50
Red 25ga (.020x.010in)	PNP3F25R	PNP3F25R-50
White 28ga (.014x.007in)	PNP3F28	PNP3F28-50 NEW

PinPort and Injector Sets

Color Connector (ODxID)	20 pc box x 20
White 22ga (.028x.016in)	PNP3M-F22
Red 22ga (.028x.016in)	PNP3M-F22R
Blue 22ga (.028x.016in)	PNP3M-F22B
White 25ga (.020x.010in)	PNP3M-F25
Red 25ga (.020x.010in)	PNP3M-F25R
White 28ga (.014x.007in)	PNP3M-F28 NEW

www.instechlabs.com/Infusion/ports/pinport.php

PinPort Injectors

	250 pc box x 50	50 pc box x 10
	PNP3M	PNP3M-50

Use only PNP3M injectors to access PinPorts. Any other type of needle will damage the PinPort septum.

Compatible Catheters

Instech provides a range of rat and mouse catheters that have been extruded for a perfect fit with 22ga and 25ga PinPorts. Access smaller anatomy, such as the mouse carotid artery or rat intrathecal space, with two-piece catheters.

PinPort	Mating Tubing/Catheter
22ga	3Fr, polyurethane preferred, .024-025in (.61-64mm) ID ideal
25ga	2Fr, polyurethane preferred, .016-.017in (.41-.43mm) ID ideal
28ga	PE-10, .011-.012in (.28-.30mm) ID

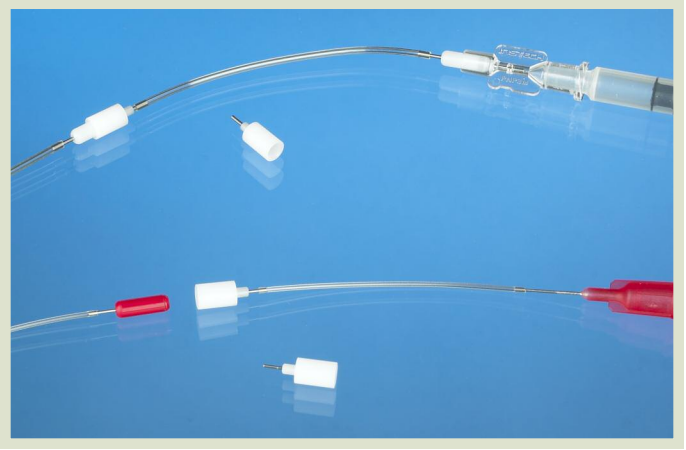
MRI-Compatible PinPorts

The inputs for these non-magnetic PinPorts and port-to-tubing connectors are made with Nitinol tubing instead of stainless steel. The injectors included with the ports do still include stainless steel tubing as it is assumed these will be used for intermittent access outside the magnetic field.

Part No.	Description	Unit
PNP3M-F22MRI	PinPort, 22ga white, non-magnetic, injector	box of 20
PNP3M-F22RMRI	PinPort, 22ga red, non-magnetic, injector	box of 20

$ www.instechlabs.com/Infusion/ports/mripinports.php

PinPort™-to-Tubing Connectors



Use a PinPort connector to access a PinPort at the end of a segment of tubing. Applications include acute experiments where tethering is not necessary, or external tubing connections where the self-sealing septum in the PinPort is helpful.

The connectors are 12mm long and feature 22ga or 25ga inputs. The tube that pierces the PinPort septum is 25ga.

They are individually packaged and EtO sterilized with a minimum order quantity of 5 pieces. The connectors can be built into custom extension sets on request, including, for example, a length of tubing and a luer stub.

Part No.	Description	Unit
PNP3MC/22	Male PinPort connector, 22ga inlet, sterile	ea
PNP3MC/25	Male PinPort connector, 25ga inlet, sterile	ea

$ www.instechlabs.com/Infusion/ports/pinportconnectors.php

PinPort for Rodent Middle Ear Access

This PinPort variant, useful for ototoxicity studies, is designed to be mounted on the skull for intermittent access to the middle ear of rats and guinea pigs via a short 3Fr catheter. The port is 16mm long with notches and a groove on the portion of the port which is embedded in dental acrylic. Dead volume is approximately 5µL. Provided sterile, individually packaged with a PinPort injector.

Part No.	Description	Unit
PNP3F22/OT160	PinPort, 16mm notched, injector, sterile	ea

$ www.instechlabs.com/Infusion/ports/rodentmiddleear.php

Low Volume Port for Luers

This specialty injection port is designed to convert the female luer of certain IV catheters into a PinPort, displacing the dead volume in the luer for critical applications and providing the closed-system benefits of the PinPort. It has been designed to fully displace the volume in the luer of a Terumo SurFlash® Safety IV catheter (shown but not included). Not all luers are alike, so in others it might bottom out before sealing or it may not displace the entire volume. The SurFlash luers have a depth of about 12.5mm which is more than most.

Access the LVP3F manually with a PinPort injector, or use the LVP3F-PNP3M/25 set for continuous connection to tubing that fits 25ga.

Part No.	Description	Unit
LVP3F	Low-volume luer injection port	ea
LVP3F- PNP3M/25	LV luer inj. port w/ mating 25ga connector	ea

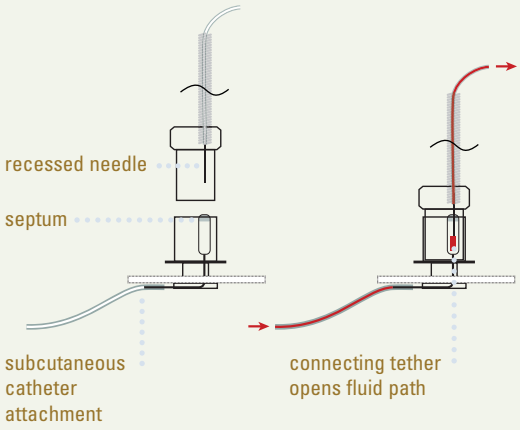
$ www.instechlabs.com/Infusion/ports/lowvolumeluerport.php

Instech's revolutionary Vascular Access Buttons and Harnesses are built around miniature externalized ports that simply and cleanly connect an implanted catheter to a syringe for direct access or to a tether for continuous access.

Buttons are implanted subcutaneously during catheterization surgery and can offer great long-term patency and the option of group housing. Harnesses can be installed after surgery but must be checked frequently so that they do not become too tight or loose.

Buttons and harnesses have been used with equal success with rats; however, buttons generally perform better than harnesses with mice.

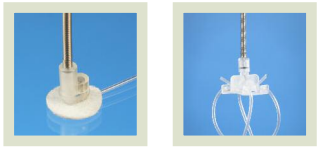
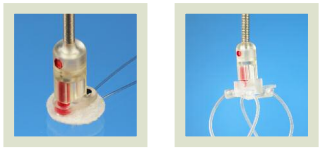
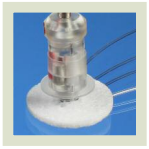
BENEFITS ✓3Rs	Button	Harness
Built-in port permits aseptic technique	●	●
Simple connection reduces handling	●	●
Minimal backflow for improved patency	●	●
Catheter not externalized	●	
No adjustment required as animal grows	●	
Group housing possible when not tethered	●	
May be installed after surgery		●
May be installed by animal vendor*	●	●



Cross section of Vascular Access Button and tether for continuous access

Vascular Access Buttons also simplify direct access with a syringe

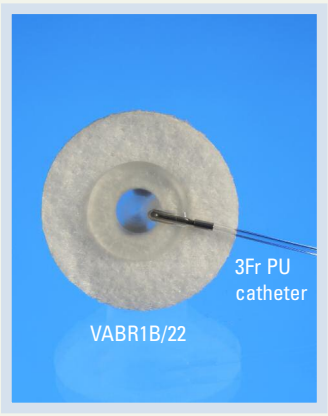
THE VASCULAR ACCESS BUTTON AND HARNESS™ FAMILY

CHANNELS	APPLICATIONS	RATS	MICE
1	Infusion Blood sampling		
2	Infusion and blood sampling Bile sampling Infusion into two vessels		
3	Blood and bile sampling Infusion and bile sampling Blood sampling and infusion into two vessels		
4	Blood and bile sampling and infusion Bile sampling and infusion into two vessels		

* For a list of surgical service vendors and their experience levels see www.instechlabs.com/downloads/InstechSurgSvcVendors.pdf

RAT BUTTONS

Vascular Access Button™, Rat, 1 Channel NEW



Catheterize

Inject or sample manually

Protect for group housing

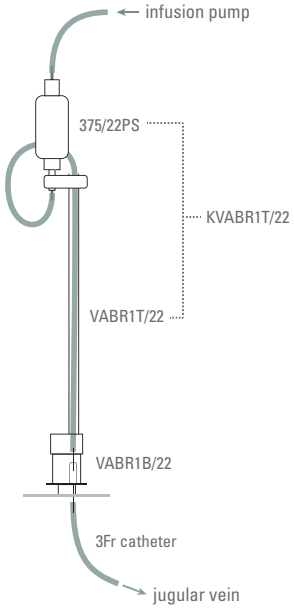
Infuse and/or sample continuously

This implantable button features an external port with a septum for quick, aseptic connection and disconnection of a catheterized rat and a one-channel tether for infusion or blood sampling, or intermittent access with a syringe fitted with a PinPort injector or PinPort connector and extension set.

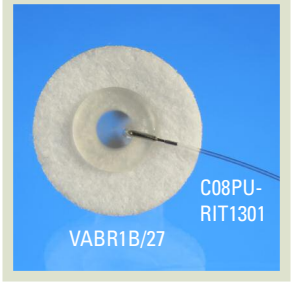
This new version features the smaller PinPorts for compatibility with the magnetic tethers and caps and PNP3M injectors used with the 2-channel rat buttons. The mating tether snaps into the button with magnets to minimize the force on the animal.

$ www.instechlabs.com/Infusion/tethers/singlevab.php

Example application: continuous infusion



Variant NEW



27ga connector for intrathecal catheters

SPECIFICATIONS

Port dead volume	3µL
Materials in fluid path	acetal, silicone, stainless steel (button) polyurethane, stainless steel (tether) polycarbonate, stainless steel (injector)
Felt material	surgical grade polyester
Felt diameter	1in (2.5cm)
Catheter compatibilty	22ga: 3Fr PU with ID of .60-.64mm 27ga: Instech intrathecal rat catheters
Tether tubing	/22: 025x055 PU, 2.9µL/cm (VAHBPU-T22) /25: 017x037 PU, 1.5µL/cm (VAHBPU-T25)
Button weight	2g

The original VAB design, with the larger port and blue twist-in tether connection, remains available.

www.instechlabs.com/Infusion/tethers/vab.php

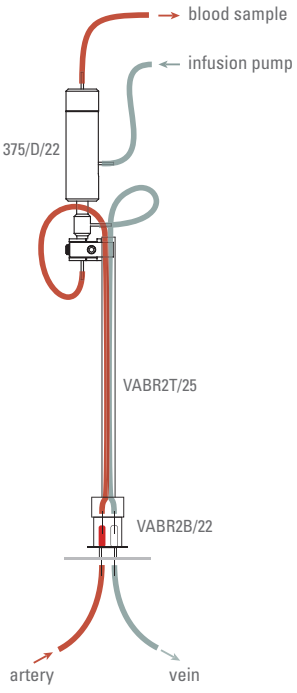
Vascular Access Button™, Rat, 2 Channel

This implantable button connects 2 independent fluid channels simply by engaging the mating tether. It is the same size as the one-channel rat Vascular Access Button. Connect two 3Fr catheters to the 22ga inputs under the felt disk. The small ports, one red and one white, can be accessed manually using a syringe fitted with a PinPort injector.

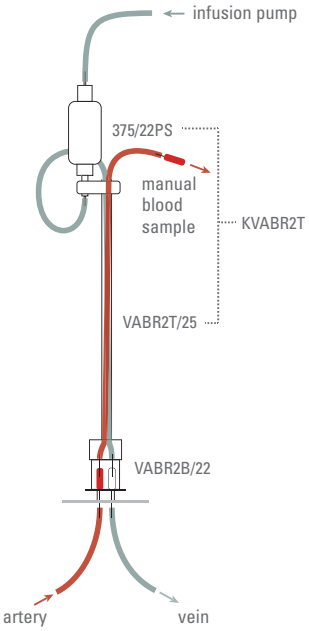
The mating tether snaps into the button with magnets to minimize the force on the animal. The magnets are oriented so that tethers can only be connected one way. Tethers, injectors and protective caps for the 1 and 2 channel buttons are compatible to add flexibility. For example, attach a 1 channel tether for continuous access to one port, leaving the other for intermittent sampling or bolus injections.

$ www.instechlabs.com/Infusion/tethers/dualvab.php

Example application: continuous infusion and blood sampling



Example application: continuous infusion intermittent blood sampling

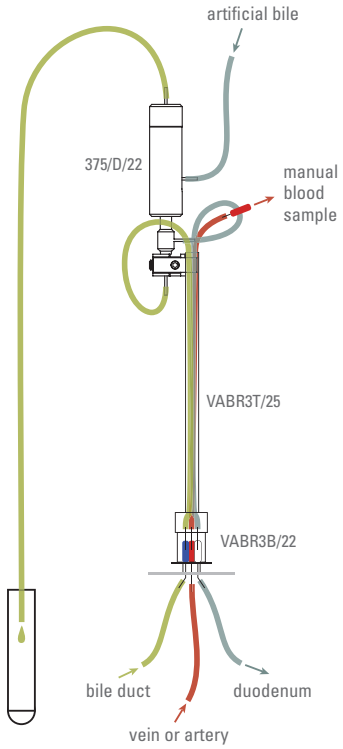


VAB™, Rat, 3 Channel NEW

The 3 channel button is frequently used for bile collection, which uses the blue and white ports with bile flowing through an extracorporeal loop prior to sampling, plus either blood sampling or infusion. Many other configurations are possible.

$ www.instechlabs.com/Infusion/tethers/triplevab.php

Example application: bile collection, bile salt replacement and blood sampling



VAB™, Rat, 4 Channel NEW

For applications such as simultaneous bile collection, blood sampling and infusion.

www.instechlabs.com/Infusion/tethers/quadvab.php

RAT BUTTONS

RAT VAB™ ORDERING INFORMATION

CHANNELS	1	2	3
BUTTON	 VABR1B/22: 1ch, 22ga VABR1B/27: 1ch, 27ga	 VABR2B/22: 2ch, 22ga	 VABR3B/22: 3ch, 22ga
INJECTOR	 PNP3M: 250pcs PNP3M-50: 50pcs	 PNP3M: 250pcs PNP3M-50: 50pcs	 PNP3M: 250pcs PNP3M-50: 50pcs
PROTECTIVE CAP FOR GROUP HOUSING	 VABRC	 VABRC	 VABRC
TETHERS other options are available	 VABR1T/22: 1ch, 025in ID tubing	 VABR2T/25: 2ch, 017in ID tubing	 VABR3T/25: 3ch, 017in ID tubing
	 VABR1T/25: 1ch, 017in ID tubing	 VABR1T/22: 1ch, white port	
		 VABR1TR/22: 1ch, red port	
		 VABR1THR/25: 1ch, red port	
BILE LOOPS	n/a	 VABR2L: white to red	 VABR3L: white to blue

Vascular Access Harness™, Rat, 1 Channel

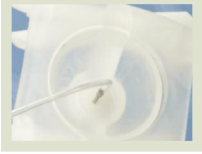
Transport or at rest

Inject or sample manually


Connect tether

Infuse or sample continuously

Instech's VAH system consists of a small external port housed in a harness which can be installed at the same time that the catheter is implanted. For best results use Instech 3Fr polyurethane catheters. Attach the catheter to a 22ga connector on the port in the harness dome and then fill the port and catheter with lock solution to maintain patency prior to use.



Access the harness manually to sample, dose or check patency using a syringe with a VAH6M injector.

To begin a continuous infusion or blood sampling study simply plug a mating VAH tether into the harness. A recessed needle built into the tether makes the fluid connection through the port. The VAH is a closed system: tether connection does not introduce contamination or air.

Harness bands should be checked regularly for appropriate fit. Rats cannot be group housed with harnesses.

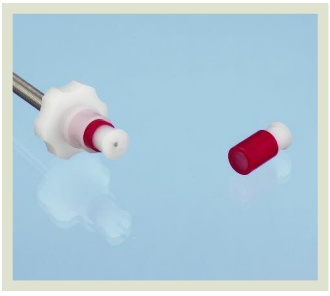
$ www.instechlabs.com/Infusion/tethers/vah.php

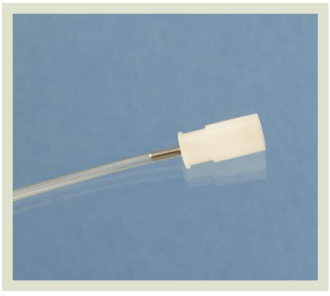
Variants


VAH95ABH harness with hole for connection to Culex® tethers


VAH95AB-1P harness with side port for intermittent access

Accessories


SIP22P tether plug to keep tether connector clean and sealed between studies


SIP22/4 replacement port

SPECIFICATIONS

Port dead volume	8µL
Septum durability	~200 sticks
Saddle size	1.13x1.13in (2.9cm)
Body surface contact area	.82in² (5.3cm²)
Standard belly band length[a]	9in (23cm)
Spring type	PS95 (1ch), PS115 (2ch)
Spring length [b]	12in (30cm)
Compatible plastic swivels	375/22PS (1ch only)
Compatible stainless swivels	375/22, 375/D/22
Standard tether tubing	VAHBPU-T22, -T22W (2ch)
Catheter connector	22ga
Compatible catheter	3Fr (.60-.64mm ID) polyurethane
Materials in fluid path[c]	PU, acetal, stainless steel, silicone
Weight of harness	5.0g (1ch) , 6.0g (2ch)

[a] Versions with extra long belly bands (14in / 36cm) are available for large rats or guinea pigs.
[b] Custom length tethers are available on request. See p38 for spring specifications.

RAT HARNESSES

Vascular Access Harness™, Rat, 2 Channel

The two channel VAH connects two independent channels as simply as the standard VAH connects one. Install the VAHD115AB harness when the catheters are implanted. Access the ports directly using a syringe with a VAH6M injector for manual flushing, injections or sampling.

Applications include bile collection, simultaneous infusion and blood sampling, blood pressure measurement and blood sampling and, with the -1P and -2P models with additional side ports, all of the above at once.

$ www.instechlabs.com/Infusion/tethers/dualvah.php

One continuous line, one line with port for intermittent access

Two continuous lines

Variants

VAHD115AB-2P 2 side ports.
Also available with one port.

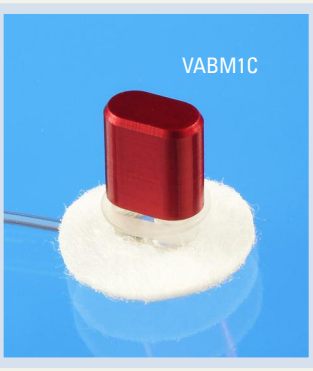
RAT VAH™ ORDERING INFORMATION

CHANNELS	1	2
HARNESS	 VAH95AB: 1ch, 22ga	 VAHD115AB: 2ch, 22ga
INJECTOR	 VAH6M: 250pcs VAH6M-50: 50pcs	 VAH6M: 250pcs VAH6M-50: 50pcs
PROTECTIVE CAP not for group housing	 VAH95CAP included	 VAHD115CAP optional
TETHERS	 VAH95T	 VAHD115T
BILE LOOP	n/a	 VAHD115L

Vascular Access Button™, Mouse, 1 Channel NEW

Catheterize and implant

Inject or sample manually

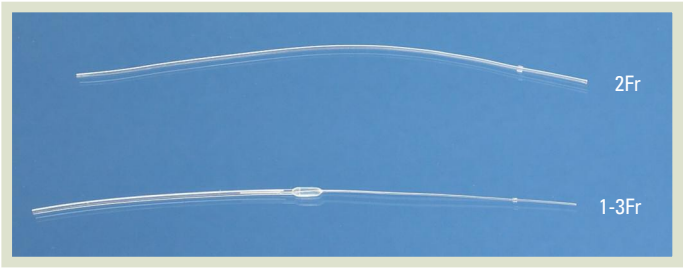


Protect for group housing

Infuse and/or sample continuously

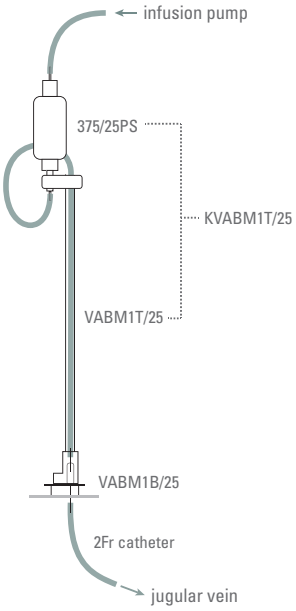
Instech's mouse VAB™ permits quick, aseptic connection and disconnection of a catheterized mouse and an infusion tether. This updated design features magnets for improved ease of use and animal welfare. Access the port built into the button directly using a syringe fitted with a mating PinPort or VAHLS25/30 injector. Use the VABMG tool to hold the button and mouse magnetically without hemostats. Connect a tether (VABM1T/25) with a 25ga swivel for continuous access; the tether connects magnetically to minimize force on the animal. Use the red aluminum VABM1C cap to protect the button stalk when group housing mice.

$ www.instechlabs.com/Infusion/tethers/singlemousevab.php



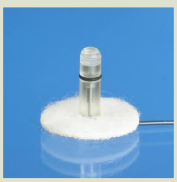
Connect straight 2Fr catheters such as C20PU-MJV1617 to 25ga buttons; connect 1-to-3Fr catheters such as C10PU-MFV1301 to 22ga buttons. (See p23 for mouse catheters.)

Example application: continuous infusion



SPECIFICATIONS

Port dead volume	3µL
Materials in fluid path	acetal, silicone, stainless steel (button) polyurethane, stainless steel (tether) polycarbonate, stainless steel (injector)
Felt material	surgical grade polyester
Felt diameter	.56in (14mm)
Catheter compatibilty	22ga: 3Fr PU with ID of .60-.64mm 25ga: 2Fr PU with ID of .41-.43mm
Tether tubing	017x037 PU, 1.5µL/cm (VAHBPU-T25)
Button weight	0.5g



The original mouse VAB design, with an o-ring based connection instead of magnets, remains available.

www.instechlabs.com/Infusion/tethers/mousevab.php

MOUSE BUTTONS

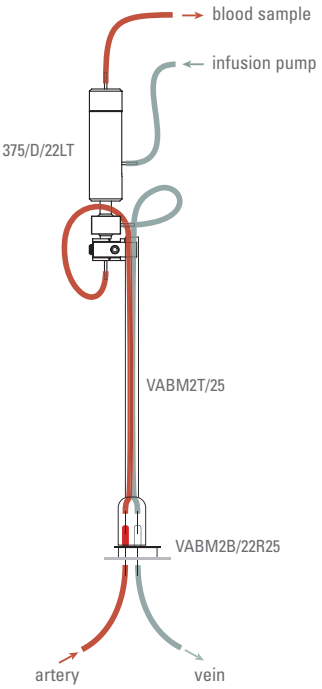
Vascular Access Button™, Mouse, 2 Ch. NEW

This new implantable button for mice connects 2 independent fluid channels simply by engaging the mating tether. It is designed for glucose clamping and other applications where simultaneous blood sampling and infusion is required. The small ports, one red and one white, can be accessed manually using a syringe fitted with a PNP3M injector.

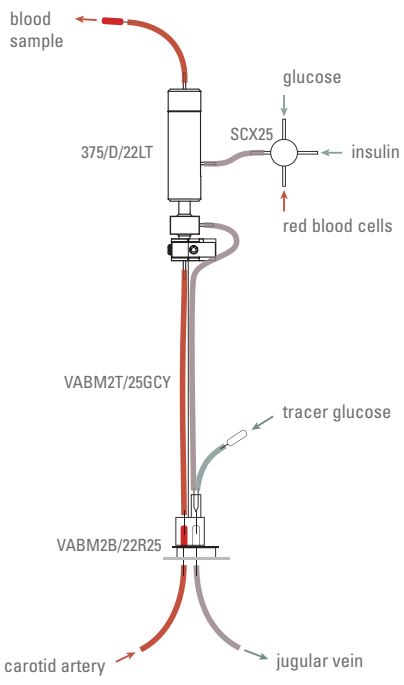
The VABM2T/25 tether uses PS80 spring, which can be connected to a 22ga low-torque dual channel swivel. Alternatively, you can connect one line to a single channel swivel for continuous access and then allow the second line to rotate freely with a PinPort for intermittent dosing or sampling, or connect a single-channel VABM1T/25 tether to the white port, leaving the red port closed.

$ www.instechlabs.com/Infusion/tethers/dualmousevab.php

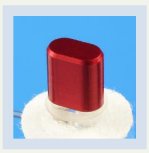
Example application: continuous infusion and blood sampling



Example application: glucose clamp



MOUSE VAB™ ORDERING INFORMATION

CHANNELS	1	2
BUTTON	 VABM1B/22: 1ch, 22ga VABM1B/25: 1ch, 25ga	 VABM2B/22R22: 22ga/22ga VABM2B/25R25: 25ga/25ga VABM2B/22R25: 22ga red/25ga white
INJECTOR	 PNP3M: 250pcs PNP3M-50: 50pcs	 PNP3M: 250pcs PNP3M-50: 50pcs
PROTECTIVE CAP FOR GROUP HOUSING	 VABM1C	 VABM2C
TETHERS	 VABM1T/25: 1ch (also connects to white port of 2ch VAB)	 VABM2T/25: 2ch  VABM2T/25GC: 2ch VABM2T/25GCY 2ch with Y
BILE LOOP	n/a	 VABM2L
HANDLING TOOL	 VABMG	

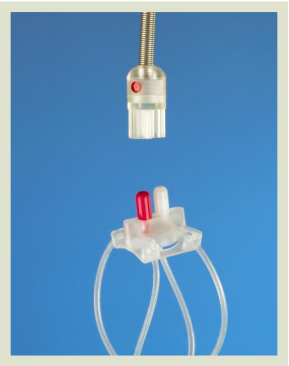
Vascular Access Harness™, Mouse, 1 Ch.


Like its larger cousin for rats, Instech's mouse VAH is installed at the time of catheterization. For best results, use polyurethane catheters that fit 22ga or 25ga, the two options for connectors on the port in the harness.

For continuous access, connect a mouse VAH tether with tubing that fits 25ga swivels. When accessing the harness port directly to infuse, withdraw or check patency, use a PNP3M injector for proper alignment and to avoid damaging the septum.

$ www.instechlabs.com/Infusion/tethers/mousevah.php

Vascular Access Harness™, Mouse, 2 Ch.




This harness tether permits simultaneous blood sampling and continuous infusion of mice. Attach two externalized catheters to the two ports in this mouse harness, one red and one white. The ports can be ordered with 22ga connectors for 3Fr catheters or 25ga for 2Fr.

Flush or sample directly from the ports using a syringe fitted with a PNP3M injector. Connect the VABM2T/25 tether to access the two channels simultaneously and run the two channels through a 375/D/22LT low-torque dual channel swivel.

$ www.instechlabs.com/Infusion/tethers/dualmousevah.php

NOTE: While harnesses and subcutaneous buttons perform equally well with rats, customers have reported that Vascular Access Buttons (p33) perform better than harnesses with mice.

MOUSE VAH™ ORDERING INFORMATION

CHANNELS	1	2
HARNESS	 VAH62AB: 1ch, 22ga VAH62AB/25: 1ch, 25ga	 VAHD80-22R22: 22ga/22ga VAHD80-25R25: 25ga/25ga VAHD80-25R22: 25ga red/22ga white
INJECTOR	 PNP3M: 250pcs PNP3M-50: 50pcs	 PNP3M: 250pcs PNP3M-50: 50pcs
TETHERS	 VAH62T	 VABM2T/25

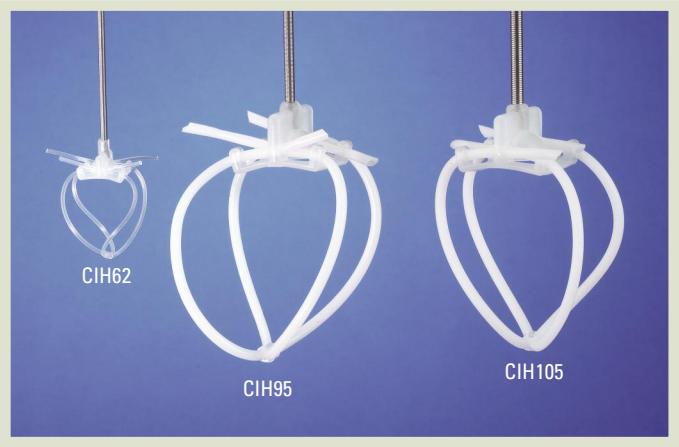
SPECIFICATIONS

Port dead volume	3µL
Materials in fluid path	acetal, silicone, stainless steel (port) polyurethane, stainless steel (tether) polycarbonate, stainless steel (injector)
Septum durability	~200 sticks
Saddle size	.56x.56in (14x14mm)
Body surface contact area	.20in² (1.3cm²)
Standard belly band length	4.5in (11cm)
Spring type	PS62 (1ch), PS80 (2ch)
Tether length, standard	7in (18cm)
Compatible plastic swivels	375/25PS (1ch)
Compatible stainless swivels	375/25, 375/D/22LT (place 1cm 062 silicone tubing over PS62 for fit)
Catheter compatibilty	22ga: 3Fr PU with ID of .60-.64mm 25ga: 2Fr PU with ID of .41-.43mm
Tether tubing, vol/cm	017x037 PU, 1.5µL/cm (VAHBPU-T25)
Harness weight	1g

LEGACY TETHERS

Covance Infusion Harnesses™

The original harness models feature a clear opening in the dome through which you feed catheter or infusion tubing into the spring tether and up to a swivel. There are two sizes of the harness, one for mice and one for rats. The rat harness has two options for spring diameter. The base part number includes the harness and spring tether, but parts are also available separately.



	CIH95	CIH105	CIH62
Clear lumen	.090in (2.3mm)	.105in (2.7mm)	.062in (1.6mm)
Saddle size	1.13x1.13in (2.9cm)	1.13x1.13in (2.9cm)	0.56x0.56in (1.4cm)
Body surface contact area	.82in^2 (5.3cm^2)	.82in^2 (5.3cm^2)	.20in^2 (1.3cm^2)
Spring type	PS95 (12in)	PS105 (12in)	PS62 (12in)
Standard belly band length	9in (23cm)	9in (23cm)	4.5in (11cm)
Compatible swivels - plastic - stainless steel	 375/22PS, 20PS any	 - any	 375/25PS any
Weight	12g	12g	3g

$ www.instechlabs.com/Infusion/tethers/cih.php

Head block tether assemblies are designed for microdialysis on freely moving animals. They provide a solid attachment to the animal with little risk of infection. Always use a counter-balanced lever arm to remove slack and to give the animal the greatest freedom of movement.

Head Block Tether for Rats

This large lumen tether can accommodate up to two standard microdialysis probes. A 3/4in (1.9cm) slotted screw is attached to the animal's skull with dental cement. A blade on the end of the spring tether slides into the screw and is secured with a knurled tubular nut.

Part No.	Description	Unit
M115S	Head block tether for rats, sterile (spring with blade, 5 slotted screws, miniature nut)	ea
M115BS	Replacement screws for M115 tether, sterile	pkg of 5
M115TS	Replacement M115 spring w/ blade, nut, no screws	pkg of 5

$ www.instechlabs.com/Infusion/tethers/M115.php

Head Block Tether for Mice

This tether uses a fine .010in diameter looped wire instead of a spring, making it lightweight and allowing it to transmit torque easily to the swivel. Attach the small peg to the animal's skull with dental cement, then connect the wire by inserting it into a hole in the peg and sliding a sleeve over it. The tether includes a special slotted clamp to attach to any of Instech's 375-series swivels.

Part No.	Description	Unit
MINF	Head block tether for mice, nonsterile (looped wire, 5 pegs & sleeves, slotted swivel clamp)	ea
MPEG	Replacement pegs and sleeves for MINF tethers	pkg of 10
MCLAMP	Slotted swivel clamp for looped-wire tethers	pkg of 5

$ www.instechlabs.com/Infusion/tethers/MINF.php

SPECIFICATIONS

	M115S	MINF
Clear lumen	.115in (2.9mm)	.070in (1.8mm)
Tether type	PS115 spring	looped wire
Tether length	12in (30cm)	12in (30cm)
Base width	0.2in	0.12in
Base height	0.8in (2cm)	0.46in (1.1cm)
System weight	10g	0.3g

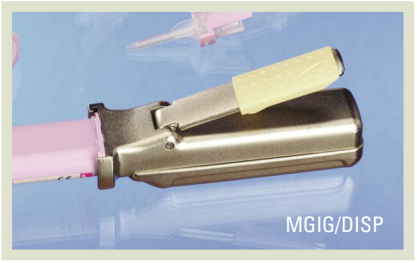
Glass Ionomer Cement for Permanent Head Attachment in Rats and Mice

This cement has advantages over commonly used methyl-methacrylate cements: it bonds to bone, eliminating the need for bone screws in most cases, it has a lower temperature increase, and it hardens more quickly with no noxious fumes. The cartridge has two chambers and the cement is only mixed in the disposable tips so that a cartridge does not have to be used all at once. An SOP for rodent head attachment is included.

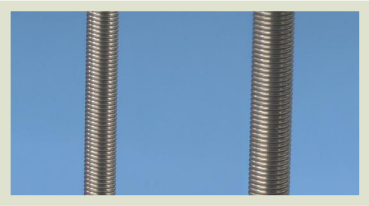
Part No.	Description	Unit
MGIG/AKIT2	Intro kit: 1x 13.3 gmcartridge, 20 tips, plastic dispenser	ea
MGIG/ARFL	Refill kit: 2x 13.3gmcartridges, 44 tips	ea
MGIG/DISP	Metal dispenser	ea

$ www.instechlabs.com/Infusion/tethers/MGIG.php

Sold for laboratory research applications only.



REPLACEMENT TETHER SPRING



Instech's infusion tethers use a range of spring types to suit the species and number of channels. 'H' signifies a heavier gauge spring which may be specified on custom tethers for extra protection if the animals can bite the tether (but using a counterbalanced mount is the best way to prevent biting). Replacement springs are available in standard packs of five 12in (30cm) lengths, non-sterile. Custom lengths are available on request.

	PS62	PS80	PS95	PS95H	PS105	PS115	PS115H
Inner diameter	.065in (1.6mm)	.080in (2.0mm)	.093in (2.3mm)	.085in (2.2mm)	.108in (2.7mm)	.118in (3.0mm)	.112in (2.8mm)
Outer diameter	.085in (2.2mm)	.104in (2.6mm)	.125in (3.2mm)	.125in (3.2mm)	.152in (3.9mm)	.152in (3.9mm)	.152in (3.9mm)
Wire diameter	.010in (0.25mm)	.012in (0.3mm)	.016in (0.4mm)	.020in (0.5mm)	.022in (0.6mm)	.017in (0.4mm)	.020in (0.5mm)

$ www.instechlabs.com/Infusion/tethers/spring.php

A swivel is a device that is inserted into the fluid path so that the infusion line can rotate as the animal moves. It is a critical part of any tethered animal infusion system. Instech's fluid swivels have been in use for nearly fifty years and have earned a reputation as the finest in the industry.

Plastic swivels are designed for researchers who prefer that the components touching the fluid path be replaced frequently to avoid cross-contamination and the cost of cleaning.

Compared to our stainless steel swivels, these models feature plastic bodies to reduce cost; however, the critical internal components are the same. For example, these swivels feature Instech's unique self-adjusting seals, a superior design that has proven reliable through tens of thousands of infusion studies.

All models include a plastic swivel-to-tether clamp for attachment to standard Instech spring tethers at no additional cost. The swivel bodies are color-coded by gauge according to international standards.

Plastic swivels are available in three sizes, with or without luer inlets, individually packaged and sterilized, or as part of preassembled infusion kits.

$ www.instechlabs.com/Infusion/swivels/37520p.php

SPECIFICATIONS

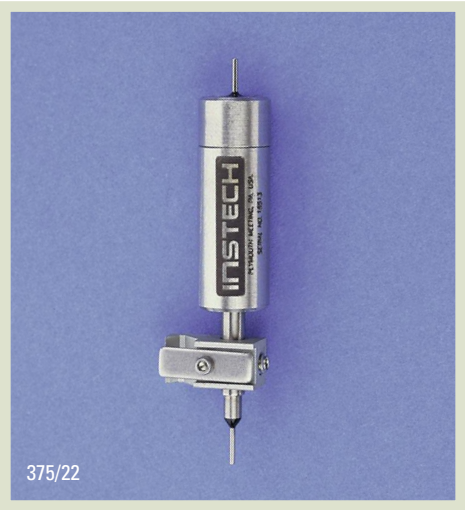
	375/25PS	375/22PS	375/20PS
Channel gauge	25ga	22ga	20ga
ID	.010in (.25mm)	.016in (.41mm)	.023in (.58mm)
Dead volume	2.5 µl	6 µl	12 µl
Typical frictional torque	.020 oz-in	.035 oz-in	.045 oz-in
Materials in fluid path[1]	SS, T	SS, T	SS, T
Compatible tubing	VAHBPU-T25, BTCOEX-25	VAHBPU-T22, BTCOEX-22	BTPE-60, BTPE-90
Compatible tether spring[2]	PS62	PS95	PS95
Autoclavable	No	No	No
Dimensions (dia. x len.)	.375x1.83in (9.5x46mm)	.375x1.83in (9.5x46mm)	.375x1.83in (9.5x46mm)
Weight	2.2g	2.2g	2.3g
Body color	Purple	Blue	Pink
Applications			
Mouse, infusion	●		
Rat, infusion		●	
Rat, BP measurement			●
Rat, viscous solutions			●
Larger animals, infusion			●

[1] Material key: SS corrosion-resistant stainless steel (304 and 316); T Teflon®. In luer models, ABS plastic body is also in fluid path.
[2] Plastic clamps included with swivels use press fit to spring tethers. Order metal adjustable CLAMP separately to use other tethers.

Luer inlet models
375/20PLS and 375/22PLS

STAINLESS STEEL SWIVELS

Single Channel Swivels

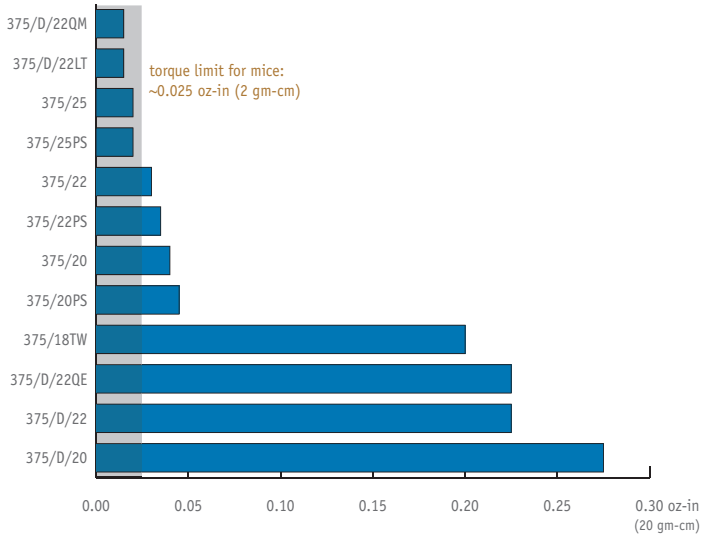


Instech single channel stainless steel swivels are autoclavable and may be reused hundreds of times. Self-adjusting seals, at the heart of every Instech swivel, actually improve with use. All stainless steel models include a universal swivel-to-tether clamp which mates with any Instech spring tether.

The standard models are typically used with rats and mice, but work with rabbits, guinea pigs and, with a SR750 strain relief, large animals as well.

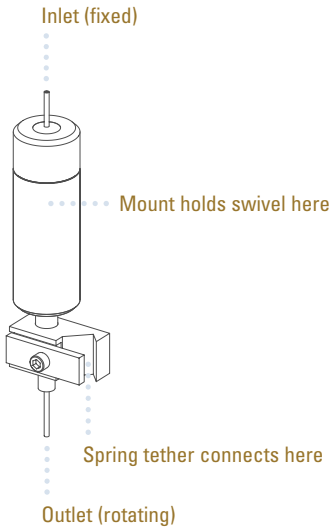
$ www.instechlabs.com/Infusion/swivels/375.php

SWIVEL FRICTIONAL TORQUE BY MODEL

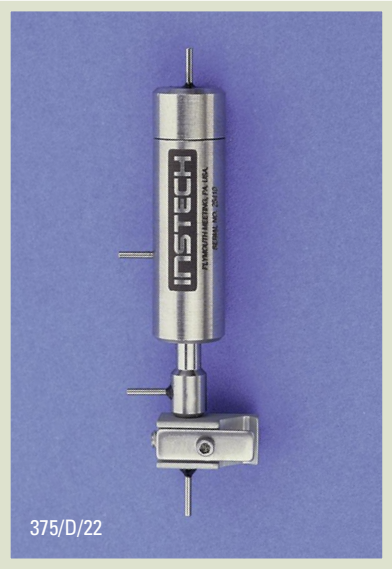


SPECIFICATIONS

	375/25	375/22	375/20
Tubing gauge	25	22	20
ID	.010in (0.25mm)	.016in (0.41mm)	.023in (0.58mm)
Dead volume	3 µl	8 µl	16 µl
Typical torque	.02 oz-in	.03 oz-in	.04 oz-in
Materials in fluid path	SS, T	SS, T	SS, T
Compatible tubing (example)	BTCOEX-25	BTCOEX-22	BTPE-60
Autoclavable	yes	yes	yes
Dimensions (D x L)	.375x2.25in (9.5x57mm)	.375x2.25in (9.5x57mm)	.375x2.25in (9.5x57mm)
Weight	15g	15g	15g
Applications			
Mouse, infusion	●		
Rat, infusion		●	
Rat, BP measurement			●
Rat, viscous solutions			●
Large animals			●



Dual Channel Swivels



A two channel swivel gives you the ability to infuse and withdraw simultaneously, to infuse on one channel while monitoring on the other, or to infuse on two lines independently.

Dual channel swivels are more delicate than single channel models, particularly the side channel, but with proper care and use can also last for many years.

The low torque 'LT model has a design similar to the 'QM microdialysis swivel but uses stainless steel tubing instead of quartz for improved durability. It is intended for infusion and blood sampling with mice. The OD is 22ga; the ID is similar to 25ga.

Microdialysis Swivels. For years, Instech's 375/D/22QE swivel has been the industry standard for awake animal microdialysis. It features quartz lining on the center channel to minimize dead volumes and reactivity with neurotransmitters. Otherwise it is the same as our 375/D/22 model, with torques that are appropriate for rats but not mice.

The 375/D/22QM uses a completely different seal design with two significant improvements: quartz lining on both the center and side channels, and extremely low frictional torque, making it the first dual channel swivel that can be used with mice. However, the 'QM model is more fragile than the 'QE and often cannot be repaired if clogged or damaged.

$ www.instechlabs.com/Infusion/swivels/375d.php

SPECIFICATIONS

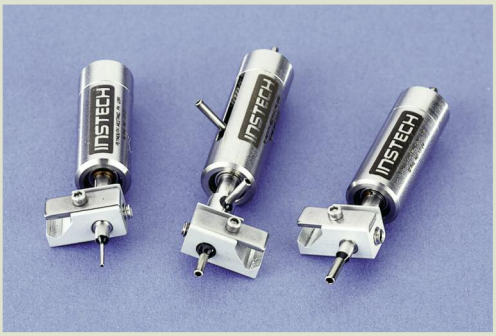
	375/D/22	375/D/20	375/D/22LT	375/D/22QE	375/D/22QM
Inlet and outlet tube gauge	22	20	22	22	22
ID - center channel	.016in (0.41mm)	.023in (0.58mm)	.0085in (0.22mm)	.006in (0.15mm)	.006in (0.15mm)
Dead volume - center channel	8 µl	18 µl	2 µl	1.4 µl	1.8 µl
ID - side channel	.016in (0.41mm)	.023in (0.58mm)	.016in (0.41mm)	.016in (0.41mm)	.006in (0.15mm)
Dead volume - side channel	18 µl	18 µl	4 µl	18 µl	3 µl
Typical frictional torque	.225 oz-in	.275 oz-in	.015 oz-in	.225 oz-in	.015 oz-in
Materials in fluid path, center[1]	SS, T	SS, T	SS, T	Q, T	Q, T
Materials in fluid path, side[1]	SS, T	SS, T	SS, T	Q, T	Q, T, P, PM
Compatible tubing (example)	BTCOEX-22	BTPE-90	BTCOEX-22	BFEP-T22Q[2]	BFEP-T22Q[2]
Autoclavable	yes	yes	no	yes	no
Dimensions (dia. x len.)	.375x2.38in (9.53x60mm)	.375x2.38in (9.53x60mm)	.375x2.38in (9.53x60mm)	.375x2.38in (9.53x60mm)	.375x2.38in (9.53x60mm)
Weight	18g	18g	15g	18g	15g
Applications					
Mouse, infusion			●		
Rat, infusion	●				
Rat, BP measurement		●			
Rat, viscous solutions		●			
Mouse, microdialysis					●
Rat, microdialysis				●	●

[1] Material key: SS corrosion-resistant stainless steel (304 and 316); P polysulfone plastic; T Teflon®; Q fused silica quartz; PM polyimide. Teflon is a registered trademark of DuPont.
[2] Note: traditional "blue widget" connectors may damage swivels when removing tubing. Use Instech silicone MC015/10 connectors instead (p 62).

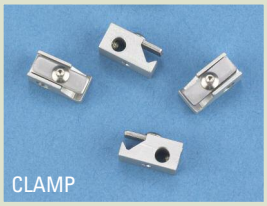
STAINLESS STEEL SWIVELS

Custom Swivels

In addition to the standard models, Instech can manufacture swivels to user specifications within the limits allowed by the seal designs. From the outside, custom swivels look just like Instech's standard stainless steel models: they are precision machined, 3/8in in diameter (compatible with all Instech swivel mounts) and 2-1/4in (single channel) or 2-3/8in (dual channel) in length. What varies is the size of the center and side channels. The largest possible single channel swivel is 16ga; the largest dual channel model is thin-walled 18ga (18TW). See the tubing chart at the end of this catalog for IDs and ODs and contact Instech for pricing and availability.



Stainless Steel Swivel Repair and Replacement Parts


CLAMP


375R/D/22

Part No.	Description	Unit
CLAMP	Universal swivel-to-tether clamp	pkg of 5
MCLAMP	Slotted swivel clamp for looped-wire tethers	pkg of 5
375R/D/xx	Tools and parts to repair 1 dual ch swivel (xx = gauge)	ea
375R/xx	Tools and parts to repair 5 single ch swivels (xx = gauge)	ea
375R/D/TK	Tools to repair dual channel swivels (no parts)	ea
375R/CSxx	Parts to repair 5 center channel seals (xx= gauge)	ea
375R/D/SSxx	Parts to repair 5 side seals (xx= gauge)	ea
375R/BR	Replacement bearings for 5 single or dual channel swivels	ea

See www.instechlabs.com/Infusion/swivels/swivelrepair.php for repair kit contents, pricing and information on returning swivels for factory service.

Be sure to clean and dry swivels after every use. Clogged channels are often not repairable. See the instruction manual for more information on maintenance.

FIVE CHANNEL SWIVELS

These remarkable swivels feature five low-dead-volume channels and rotational torque as low as that of our one-channel models.

The practical limit on the number of lines in a traditional fluid swivel has been two; swivels with three or more channels are typically impossible for a rodent to turn and can have large dead volumes or problems with cross-channel leakage.

Channels are color coded to match inlets and outlets

To solve these problems Instech has kept the seals tight but added a motor to assist the rotation. A controller senses the animal's movement and drives the swivel core to follow the animal. Unlike switch-based systems, this swivel features a proportional control, allowing fine continuous movement to minimize stress on the animal. The torque felt by the animal is similar to that of an Instech single channel swivel.

The control unit mounts to the vertical portion of the counter-balanced arm and is powered by a 12VDC adapter. The analog motor drive signal is available as an output for rotational activity monitoring.

The swivel is counter-balanced to minimize forces on the animal. While the power assist circuitry is responsive enough that a mouse can turn the swivel, use with mice is not recommended due to the negligible weight of the animal relative to the swivel.

There are three standard configurations with a variety of combinations of microdialysis channels, which have low dead volume and are lined to protect neurotransmitters, and standard 22ga infusion channels.

	Channel				
Part No.	1	2	3	4	5
MCS/5A	µD	µD	µD	µD	22ga
MCS/5B	22ga	22ga	22ga	22ga	22ga
MCS/5C	µD	µD	22ga	22ga	22ga

$ www.instechlabs.com/Infusion/swivels/mcs.php

SPECIFICATIONS

Number of channels	5
Dead volume - µD channels	6-7 µl
Dead volume - 22ga channels	15-20 µl
ID - µD channels	0.009in (0.2mm)
ID - 22ga channels	0.015in (0.4mm)
OD - all channels	0.028in (0.7mm) - 22ga
Materials in fluid path	Titanium, polyimide, Teflon®
Rotational activity output	Analog signal, ±2V maximum
Lever arm length	5.75in (14.6cm)
Swivel dimensions (L x Dia)	7in x 0.6in (18x1.5cm)
Swivel weight	95 gms (counterbalanced)

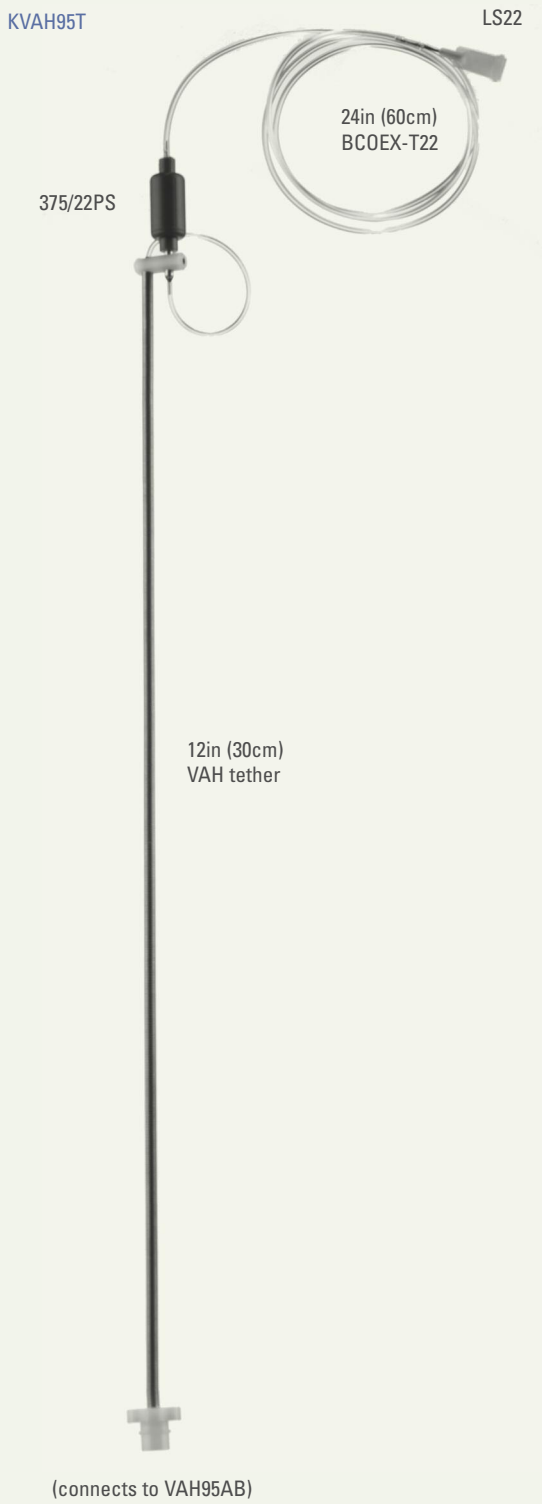
INFUSION KITS

Infusion kits reduce the time and expense of preparing for an infusion study while providing sterile equipment to reduce the risk of infection. Each kit contains everything you need, including swivel, tether, tubing, and connectors. You may also use a custom kit to define a simple extension set (for example, a length of tubing with a luer). Tubing and tethers will be cut to the lengths you specify, assembled in a cleanroom, then sterilized using ethylene oxide.

After a discussion to define the contents, your kit will be assigned a unique part number. The standard minimum order quantity is 25 kits. This minimum is waived on initial trial orders and there is no minimum order quantity on our generic kits such as those listed below.

Part No.	Description
KVABR1T/22	1-channel rat magnetic VAB tether kit
KVABR1T/25-ABS	1-channel rat magnetic VAB tether kit for ABS
KVABR2T	2-channel rat magnetic VAB tether kit
KVABR1TR/25-ABS	1-channel rat VAB tether kit for ABS (red port)
KVAH95T	1-channel rat VAH tether kit
KVAH115T	2-channel rat VAH tether kit
KVABM1T/25	1-channel mouse magnetic VAB tether kit

EXAMPLE KIT



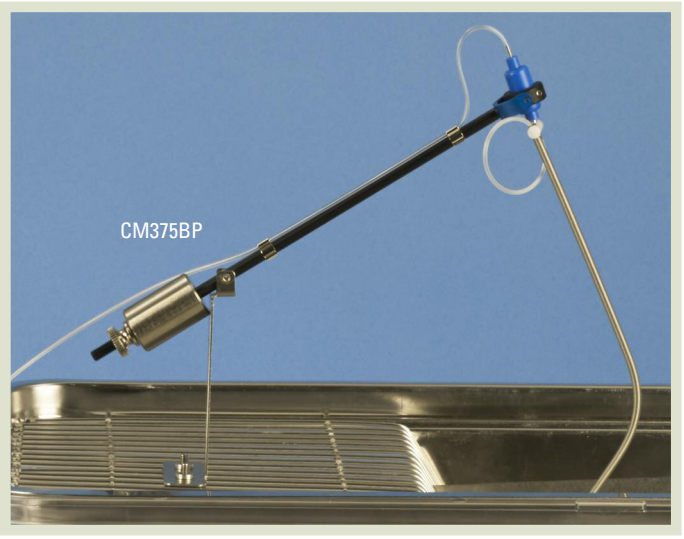
Mounting a swivel to your particular animal cage can be one of the most frustrating steps in setting up your animal infusion system. Improper mounting can lead to damaged tethers and added stress on animals. Instech has pulled from its years of experience designing custom systems to create this line of swivel mounts. If at all possible, use swivel mounts that are counter-balanced to remove slack from the tether.

BENEFITS ✓3Rs

A lever arm takes weight off the animal so that it can move more freely

Also reduces chewing on tethers which can lead to dropouts

Single-Axis Lever Arms



This mount is designed for standard infusion of rats in shoebox cages. The mount pivots in the vertical plane to remove slack from the tether but allow enough length to reach all corners of an asymmetrical cage. The adjustable counter-weight can be set to balance the weight of our swivels plus a tether. Crossbars in the wire top should be cut so that the tether can travel the length of the cage.

Part No.	Description	Unit
CM375BP	Single-axis lever arm for plastic swivels	ea
CM375BS	Single-axis lever arm for stainless steel swivels	ea
CM/T143	Slotted top for 10.5in x 19.8in rodent cages	ea

$ www.instechlabs.com/Infusion/swivelmounts/cm375bp.php

Snap-in Spring Swivel Arm NEW

This new swivel mount uses a flexible spring to balance the weight of the swivel and tether and prevent slack as the animal moves. Instech swivels can be snapped into or out of the arm with one hand and no tools. Use with a slotted cage lid so that the animal can be removed without disconnecting its tether.

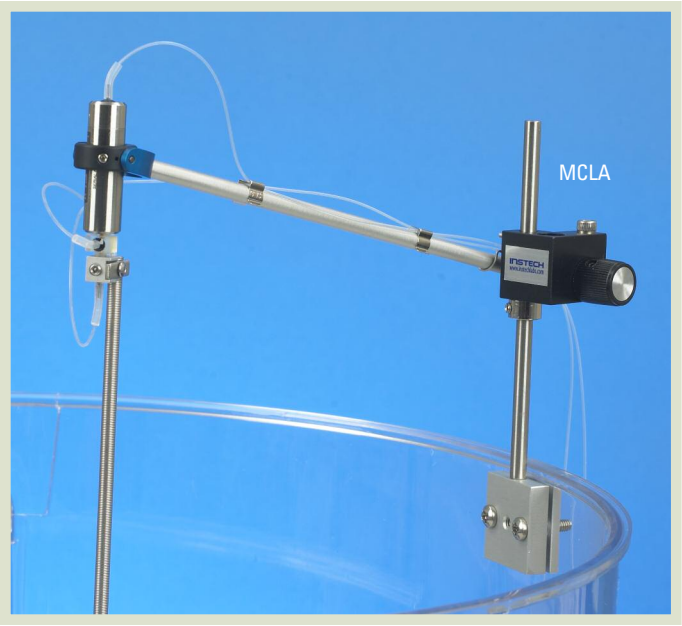
Part No.	Description	Unit
CM375KRP	Single-axis lever arm for plastic swivels	ea

$ www.instechlabs.com/Infusion/swivelmounts/cm375krp.php

The spring mount is available in configurations for cage racks; contact Instech for more information as cage rack systems typically involve custom modifications.

SWIVEL MOUNTS

Multi-Axis Lever Arms



These counter-balanced lever arms move vertically and horizontally with the animal to prevent slack in the tether. Their sensitivity makes them ideal for awake-animal microdialysis and all types of infusion studies with mice. They feature an adjustable spring counter-balance, not a mass, which increases their responsiveness to an animal's quick movements.

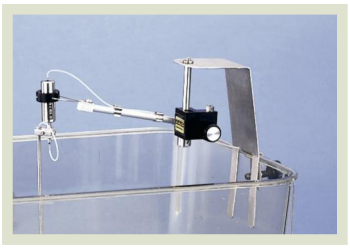
The mounting plate can be adjusted for mounting to the side or top of many types of cages, including Instech's tanks. Both the 6in-long (15cm) MCLA and 3.5in (9cm) SMCLA models include the gimbal which holds the swivel and the locking mechanism to keep the gimbal in its groove at the end of the arm.

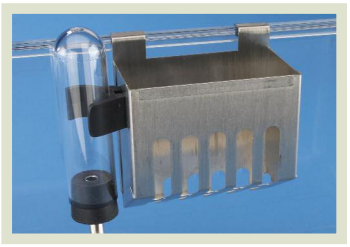
Versions of these balance arms are also available for metabolism cages and operant chambers for IV self-administration.

Part No.	Description	Unit
MCLA	6in multi-axis lever arm for rats	ea
SMCLA	3.5in multi-axis lever arm for mice	ea
SMCLA/META	Counter-balanced lever arm for Techniplast metabolism cage, with 8in (20cm) diameter lid	ea
SMCLA/METALP	Counter-balanced lever arm for Lab Products metabolism cage, with 8in (20cm) diameter lid	ea
MCLA/MED	Counter-balanced lever arm, for Med Associates rat self admininistration cage	ea
SMCLA/MED	Counter-balanced lever arm, for Med Associates mouse self administration cage	ea
MCLA/GC	Counter-balanced lever arm, 6in, with holder for SCX22 or SCX25 for glucose clamping	ea
SMCLA/GC	Counter-balanced lever arm, 3.5in, with holder for SCX22 or SCX25 for glucose clamping	ea

$ www.instechlabs.com/Infusion/swivelmounts/mcla.php

Mouse Micro-Isolator Cage Mount





Use this mount to infuse mice while maintaining a safe micro-environment for nudes and transgenics. It is designed to attach to standard micro-isolator cages, such as those made by Allentown Caging and Lab Products, with no modifications to the cage or cover. Includes a spring counter-balanced lever arm attached to a bracket with holes to protect the IV lines as they enter and exit the cage. Feeder and water bottle are available separately.

Part No.	Description	Unit
CMMI/65	Mouse micro-isolator cage mount	ea
CMMI/F	Feeder for mouse micro-isolator cages	ea
CM/W50	50ml water bottle for CMMI/F	ea

$ www.instechlabs.com/Infusion/swivelmounts/cmmi65.php

Fixed Swivel Mount for Metabolic Cages

These mounts hold a swivel in a fixed position above a standard Techniplast (Nalgene) or Lab Products metabolism cage. Parts included: vertical and horizontal mounting bars with hardware, new cage top with pre-drilled mounting holes. Available with slotted lids for easier access to the animal.

Part No.	Description	Unit
METAMOUNT	Swivel mount for Techniplast metabolism cage	ea
METAMOUNT/SL	Swivel mount for Techniplast cage, slotted lid	ea
METAMOUNTLP/SL	Swivel mount for Lab Products metabolism cage, slotted lid	ea

$ www.instechlabs.com/Infusion/swivelmounts/metamount.php

Instech's clear animal enclosures are ideal for tethered rodents, as they have no sharp corners where the tether can catch or tangle. Originally designed for short-term microdialysis experiments, the tanks can be ordered pre-machined to accommodate feeders and water bottles in order to house animals for longer periods. The floor areas of the two models exceed USDA regulations and NRC guidelines for the largest singly-housed rats and mice.[1]

The feeders and water bottles mount outside the tank to avoid interference with the tether. The feeder pellet opening is approximately 13x20mm.

Use the 6-inch MCLA lever arm with the larger rat tank and the 3.5-inch SMCLA arm with the small mouse tank.

Part No.	Description	Unit
MTANK	Clear animal enclosure, 15in high	ea
MTANK/W	Clear enclosure, 15inH drilled for MWATER	ea
MTANK/F	Clear enclosure, 15inH drilled for MFEEDER	ea
MTANK/WF	Clear enclosure, 15inH drilled for MWATER & MFEEDER	ea
STANK	Clear animal enclosure, 8.5in high	ea
STANK/W	Clear enclosure, 8.5inH drilled for CM/W50	ea
STANK/F	Clear enclosure, 8.5inH drilled for MFEEDER	ea
STANK/WF	Clear enclosure, 8.5inH drilled for CM/W50 & MFEEDER	ea
MTOP	Slotted cover for MTANK	ea
MFEEDER	Feeder for MTANK or STANK	ea
MWATER	Water bottle for MTANK	ea
SSCREEN	Bottom screen for STANK	ea
STOP	Slotted cover for STANK	ea
CM/W50	50ml water bottle for STANK	ea

$ www.instechlabs.com/Infusion/accessories/clearenclosures.php

MFEEDER and CM/W50 (mice)

MFEEDER and MWATER (rats)

SPECIFICATIONS

	MTANK	STANK
Height	15in (38cm)	8.5in (22cm)
Diameter	10.5in (27cm)	5.5in (14cm)
Floor area	87in² (570cm²)	24in² (150cm²)
Material	polycarbonate	polycarbonate

[1] "Guide for the Care and Use of Laboratory Animals." National Academy Press. 1996.

BULK TUBING

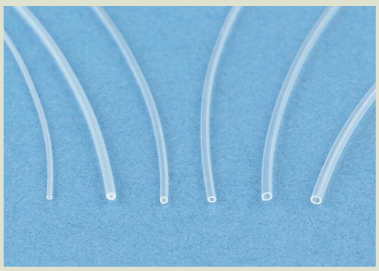
Instech offers a range of bulk tubing for laboratory animal infusion and microdialysis, including polyethylene, polyurethane, silicone, co-extruded PE/PVC and FEP tubing. Most tubing comes on convenient spools of 30 meters.

TUBING MATERIAL COMPARISON

	Silicone	Polyurethane	Polyethylene	Polyvinyl-chloride
Hemocompatibility	Excellent	Excellent	Fair	Fair
Compound Compatibility	Possible reactivity	Possible reactivity	Inert	Possible reactivity
Stiffness	Soft	Soft	Stiff	Soft or stiff
Ease of Insertion	Difficult	Moderately easy	Easy	Moderately easy
Sizes Available	Many	Many	Many	Few
Ease of Bonding	Excellent	Fair	Poor	Fair
Memory	Excellent	Poor	Poor	Poor
Tear Strength	Poor	Excellent	Excellent	Excellent
Air Permeability	High	Moderate	Low	Low
Sterilization	EtO or steam	EtO	EtO	EtO

Tubing IDs and ODs typically vary by ±.002in (.05mm) from the nominal specs noted here. When dead volume is critical measure it directly by comparing the weights of filled and empty segments.

Polyethylene Tubing



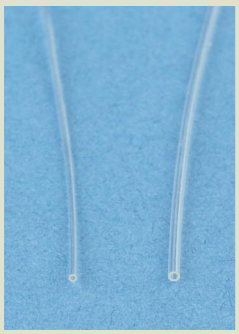
Instech's PE tubing solves one of the biggest problems with PE: the price. The low density formulation and sizes are comparable to Intramedic™ tubing. To avoid kinking, consider co-extruded PE/PVC.

Part No.	Compare	Fits	OD		ID		1mm
BTPE-10	PE 10		.024in	.60mm	.011in	.28mm	
BTPE-20	PE 20		.043	1.09	.015	.38	
BTPE-25		25ga	.036	.91	.018	.46	
BTPE-50	PE 50	22ga	.038	.97	.023	.58	
BTPE-60	PE 60	20ga	.048	1.22	.030	.76	
BTPE-90	PE 90		.050	1.27	.034	.86	

Spool of 30m (98ft), non-sterile. Do not autoclave.
Intramedic is a trademark of Becton Dickinson and Company.

$ www.instechlabs.com/Infusion/tubing/polyethylene.php

Polyurethane Intravascular Tubing



This is the most commonly used formulation of polyurethane for laboratory animal research. It is the same tubing we use to make our finished catheters. The 2 and 3Fr sizes have been specifically extruded to have ideal fits with PinPorts and Vascular Access Harnesses and Buttons: 2Fr fits 25ga, 3Fr fits 22ga. The 1Fr size is used in two-piece mouse catheters; the 32ga size is used in intrathecal catheters.

Part No.	Size	Fits	OD		ID		1mm
BTPU-010	32ga	-	.010in	.25mm	.005in	.13mm	
BTPU-014	1Fr	-	.014	.4	.007	.2	
BTPU-027	2Fr	25ga	.027	.7	.017	.4	
BTPU-040	3Fr	22ga	.040	1.0	.025	.6	

2 and 3Fr on spools of 30m (98ft); 1Fr and 32ga on spools of 10m. Non-sterile. Do not autoclave.

$ www.instechlabs.com/Infusion/tubing/polyurethaneIntra.php

Silicone (Silastic®) Intravascular Tubing

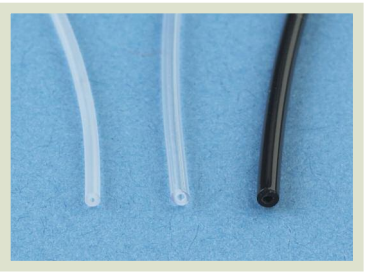
This tubing, made from Dow Corning Silastic®, is the same platinum-cure material that has been implanted in laboratory animals for years. Sterilize by EtO gas or steam/autoclave.

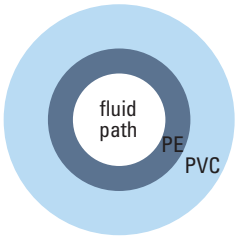
Part No.	Size	OD		ID		1mm
BTSIL-025	2 Fr	.025in	.64mm	.012in	.31mm	
BTSIL-037	3 Fr	.037	.94	.020	.51	
BTSIL-047	3.5 Fr	.047	1.2	.025	.64	
BTSIL-065	5 Fr	.065	1.7	.030	.76	
BTSIL-085	7 Fr	.085	2.2	.040	1.0	

Spool of 15m (50ft), non-sterile.

$ www.instechlabs.com/Infusion/tubing/silastic.php

Co-extruded PE/PVC Tubing





This tubing is co-extruded with polyethylene on the inside for compound compatibility and PVC on the outside to resist kinking and prevent evaporation.

It is designed for external infusion set connections and is not for intravascular use. Critical joints should be glued to prevent accidental disconnection as this type of tubing can take a set around the stainless steel tube.

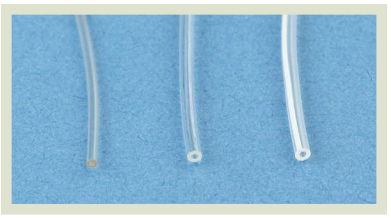
It is available in two sizes to mate with 22ga or 25ga swivels, PinPorts, couplers and luer stubs. A version with black PVC is available for protection of light sensitive compounds.

Part No.	Fits	Color	OD		ID		1mm
BTCOEX-25	25ga	Clear	.051in	1.3mm	.017in	.4mm	
BTCOEX-22	22ga	Clear	.064	1.6	.024	.6	
BTCOEX-22B	22ga	Black	.072	1.8	.024	.6	

Spool of 30m (98ft), except black which is spool of 15m (49ft), non-sterile.

$ www.instechlabs.com/Infusion/tubing/coex.php

Polyurethane External Infusion Tubing



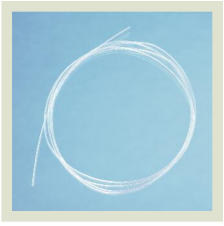
This PU tubing is designed for a reliable friction fit with 22 or 25 gauge swivels and couplers. The elasticity and thick wall minimizes the chance of accidental disconnection, kinking or perforation. Used in VAH and VAB tethers. The 22ga version is available with a white stripe to differentiate dual channel connections. Not intended for intravascular use.

Part No.	Fits	Stripe	OD		ID		1mm
VAHBPU-T25	25ga	none	.037in	.9mm	.017in	.4mm	
VAHBPU-T22	22ga	none	.055	1.4	.024	.6	
VAHBPU-T22W	22ga	white	.055	1.4	.024	.6	

Spool of 30m (98ft), non-sterile.

$ www.instechlabs.com/Infusion/tubing/pu.php

FEP Microdialysis Tubing

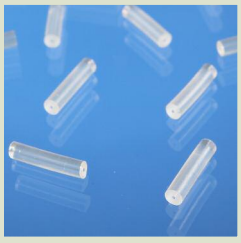


Designed to connect microdialysis probes to swivels, pumps and fraction collectors, this custom-extruded FEP tubing has the same inner and outer diameters as our 22ga quartz-lined swivels: 0.006x0.028in (0.15x0.71mm). Internal volume is approximately 0.18µL/cm. Use MC015/10 tubing connectors.

Part No.	Description	1mm	Unit
BFEP-T22Q	FEP tubing, .006x.028in, 1m lengths, sterile		pkg of 10

$ www.instechlabs.com/Infusion/tubing/fep.php

Microdialysis Tubing Connectors



These silicone tubing segments are sized to connect FEP microdialysis tubing to swivels, probes, and syringes with no added dead volume. They do not need to be swelled by soaking in alcohol prior to installation, as do traditional "blue widgets," which in turn eliminates the possibility of damage to the swivel when removing tubing.

Part No.	Description	Unit
MC015/10	Microdialysis tubing connector, .015inIDx10mm	pkg of 100

$ www.instechlabs.com/Infusion/tubing/mc.php

TUBING CONNECTORS

Luer Stubs (Blunt Needles)

Female luer stubs have blunt tips to connect infusion tubing or catheters to syringes or other male luer connectors. The hubs are polypropylene; the tips are stainless steel. Available non-sterile or EtO sterilized.

			Non-sterile		Sterile
Size	Color	Tube Length	100 pcs	1000 pcs	250 pcs
14ga	dk. green	0.5in (13mm)	LS14	LS14K	LS14S
15ga	amber	0.5in (13mm)	LS15	LS15K	LS15S
16ga	violet	0.5in (13mm)	LS16	LS16K	LS16S
17ga	white	0.5in (13mm)	LS17	LS17K	LS17S
18ga	green	0.5in (13mm)	LS18	LS18K	LS18S
20ga	pink	0.5in (13mm)	LS20	LS20K	LS20S
21ga	purple	0.5in (13mm)	LS21	LS21K	LS21S
22ga	blue	0.5in (13mm)	LS22	LS22K	LS22S
22ga	blue	0.25in (6mm)	LS22/6	LS22/6K	LS22/6S
23ga	orange	0.5in (13mm)	LS23	LS23K	LS23S
25ga	red	0.5in (13mm)	LS25	LS25K	LS25S
27ga	gray	0.5in (13mm)	LS27	LS27K	LS27S

Sterile luer stubs packaged in 50 pouches of 5.

$ www.instechlabs.com/Infusion/tubing/luer.php

Couplers & Plugs

Use couplers to connect catheters to external infusion tubing. Use a plug to seal off an externalized catheter before an infusion experiment begins.

These are made of medical grade stainless steel and deburred to prevent damage to tubing. Non-sterile; can be sterilized on request.

Part No.	Type	Size	Length	Unit
SC17/15	Coupler	17ga	15mm	pkg of 100
SC20/15	Coupler	20ga	15mm	pkg of 100
SC22/15	Coupler	22ga	15mm	pkg of 100
SC22/8	Coupler	22ga	8mm	pkg of 100
SC23/8	Coupler	23ga	8mm	pkg of 100
SC25/10	Coupler	25ga	10mm	pkg of 100
SC27/8	Coupler	27ga	8mm	pkg of 100
SP20/12	Plug	20ga	12mm	pkg of 100
SP22/12	Plug	22ga	12mm	pkg of 100
SP23/12	Plug	23ga	12mm	pkg of 100
SP25/12	Plug	25ga	12mm	pkg of 100

$ www.instechlabs.com/Infusion/tubing/connectors.php

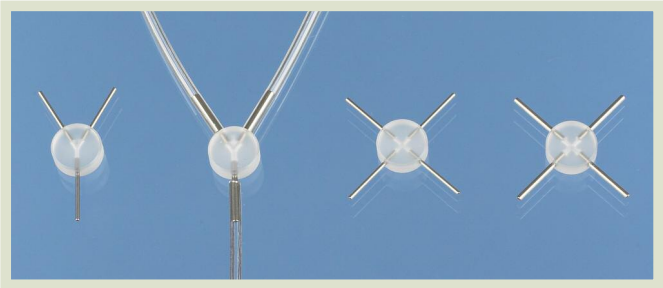
Right Angle Coupler

These 22ga couplers are bent to a right angle; one side is approximately 11mm; the other 5mm. Provided with a sealed segment of tubing to close off one end.

Part No.	Description	Unit
SC22/15RA	Right angle couplers, 22ga, sterile	ea

$ www.instechlabs.com/Infusion/tubing/ra.php

3-Way and 4-Way Connectors



Commonly used in glucose clamp studies, Instech's 3- and 4-way tubing connectors feature stainless steel tubes and a hub made of PCTFE, a chemically resistant plastic. Tubes extend approximately 6mm from the hub. Dead volume from one channel to the next is less than 3µl.

Part No.	Type	Tubing Size	Unit
SCY22	3-way	22ga	ea
SCY25	3-way	25ga	ea
SCX22	4-way	22ga	ea
SCX25	4-way	25ga	ea

Individually packaged and EtO sterilized

$ www.instechlabs.com/Infusion/tubing/y.php

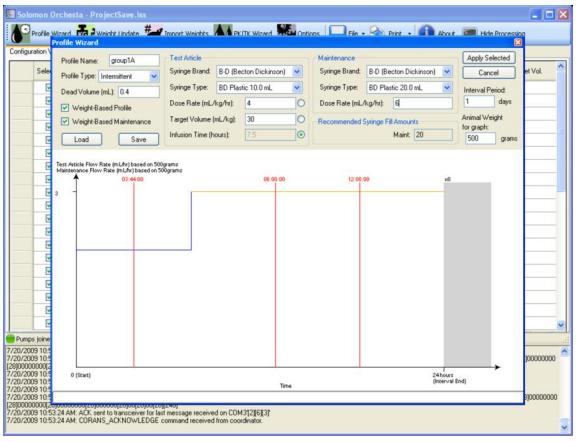
ORCHESTA™ INFUSION AUTOMATION

Instech's OrchesTA™ Infusion Automation system was developed over several years in close collaboration with CROs to automate preclinical infusion toxicology studies. Built not around pieces of hardware or software, but rather the processes of GLP infusion studies, the system comprises validated control and monitoring software, a simple but robust wireless network that can be run by animal technicians without IT experience, and clinical-grade pumps—either syringe pumps (typically for rodents) or ambulatory pumps (typically for large animals).

Small Animal (Syringe Pumps)

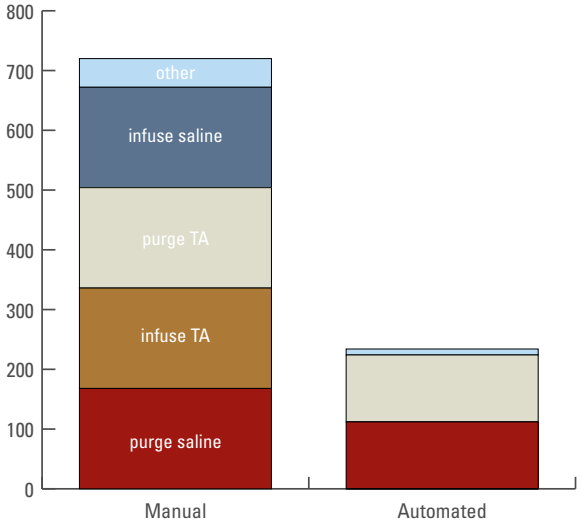
OrchesTA version D software controls and monitors a network model 100 syringe pumps to streamline and automate large-scale rodent infusion toxicology sutides.

Automated Programming. Pump programming for multiple dose groups takes less than twenty minutes at the PC during study setup. Flow rates are updated automatically by importing new weight tables. As a result, OrchesTA can increase productivity by more than 100%. Furthermore, since each manual keystroke is a chance for human error, it can reduce the opportunities for dosing and documentation errors by more than 99%.



LABOR SAVINGS

Total labor for a 200 animal, 28 day study with 1 intermittent dose/day (hours)



Alexander A (Covance Laboratories), "Use of an Automated Infusion Pump/Software System to mitigate challenges inherent to Preclinical Infusion Studies," presentation at ITO Conference, Barcelona, 15 Sep 2011; customer interviews.

ERROR REDUCTION

Total opportunities for errors in a 200 animal, 30 day study with 1 intermittent dose/day

	Manual	Automated
Software keystrokes	0	99
Pump keystrokes	114,000	0
Incorrect syringe loading	12,000	0
Incorrect animal ID	18,000	200
Dose spreadsheet	15,200	0
Documentation	48,000	0
Total	201,200	299
Reduction		99.85%

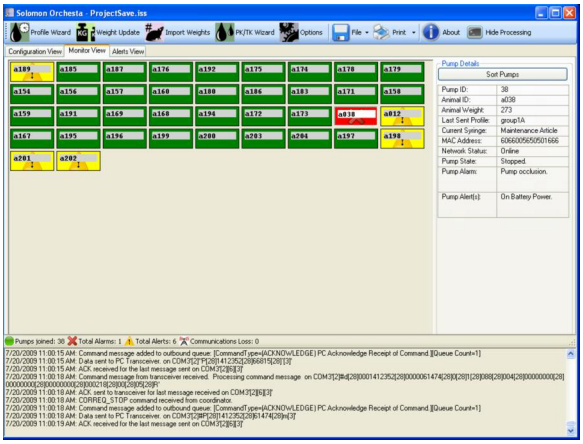
Agate J, Jacobson A (Solomon Scientific), "Dosing & Documentation Errors in Preclinical GLP Infusion Studies," Jan 2011.

Test Article Edge Tracking. This patented* feature of the OrchesTA software calculates and records the exact time that test article enters the animal and the time that the dose is complete when switching from saline to test article and back to saline, eliminating tedious manual calculations.

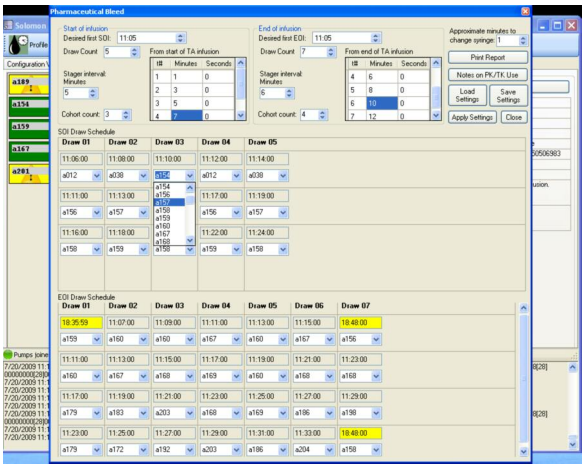
Multi-step Infusion Profiles. The software supports studies with loading doses and multiple infusion rates, even optional pauses.

Email or Text Message Alerts. Remote alarming reduces the amount of on-site monitoring required by valuable personnel. Sophisticated templates make sure the right staff member receives alerts in an appropriate timeframe.

Centralized Monitoring. All pumps are displayed real-time on a single PC monitor. Pump alarms are displayed on the monitor in red. Less serious alerts are displayed in yellow.



PK/TK Scheduling. OrchesTA™ simplifies complex planning of PK/TK blood samples by scheduling all samples and automatically adjusting saline purge rates so that test article is delivered to each animal at the intended time and at the prescribed rate.



Automated Documentation. Validated for GLP and Part 11 compatibility, the software records every PC and pump interaction and system event with time/date, user ID and user explanation data, replacing all handwritten documentation and creating a robust audit trail. The software compiles infusion study data into numerous formatted final reports.

Robust Wireless Network. OrchesTA™ uses a secure network designed specifically for the challenges of animal laboratories. The IEEE 802.15.4 standard is meant for a high number of small devices, low power consumption, low bandwidth and ease-of-use—exactly what is needed for a network of infusion pumps. By comparison, Wi-Fi is designed for high bandwidth and requires more power, and Bluetooth is meant for a small number of devices at close range.

Large Animal (Ambulatory Pumps)

Jacket courtesy of Lomir Biomedical

The OrchesTA™ version G software controls and monitors model 500 ambulatory pumps (p55) to deliver a number of benefits in addition to automated programming and documentation of large animal infusion studies.

Remote Start/Stop. Minimizing interaction with animals can be critical in telemetry, cardiology and addiction studies.

Variable Front-End Purge. The start time of test article administration is controlled precisely without having to prime test article to the catheter tip, improving patency and avoiding the risk of test article entering circulation earlier than planned.

Automatic Restart After Occlusion. If an occlusion occurs that resolves itself without human intervention (for example, the animal moves and unkinks tubing), the system will, optionally, restart ther pump automatically when the pressure falls to an acceptable range.

SPECIFICATIONS

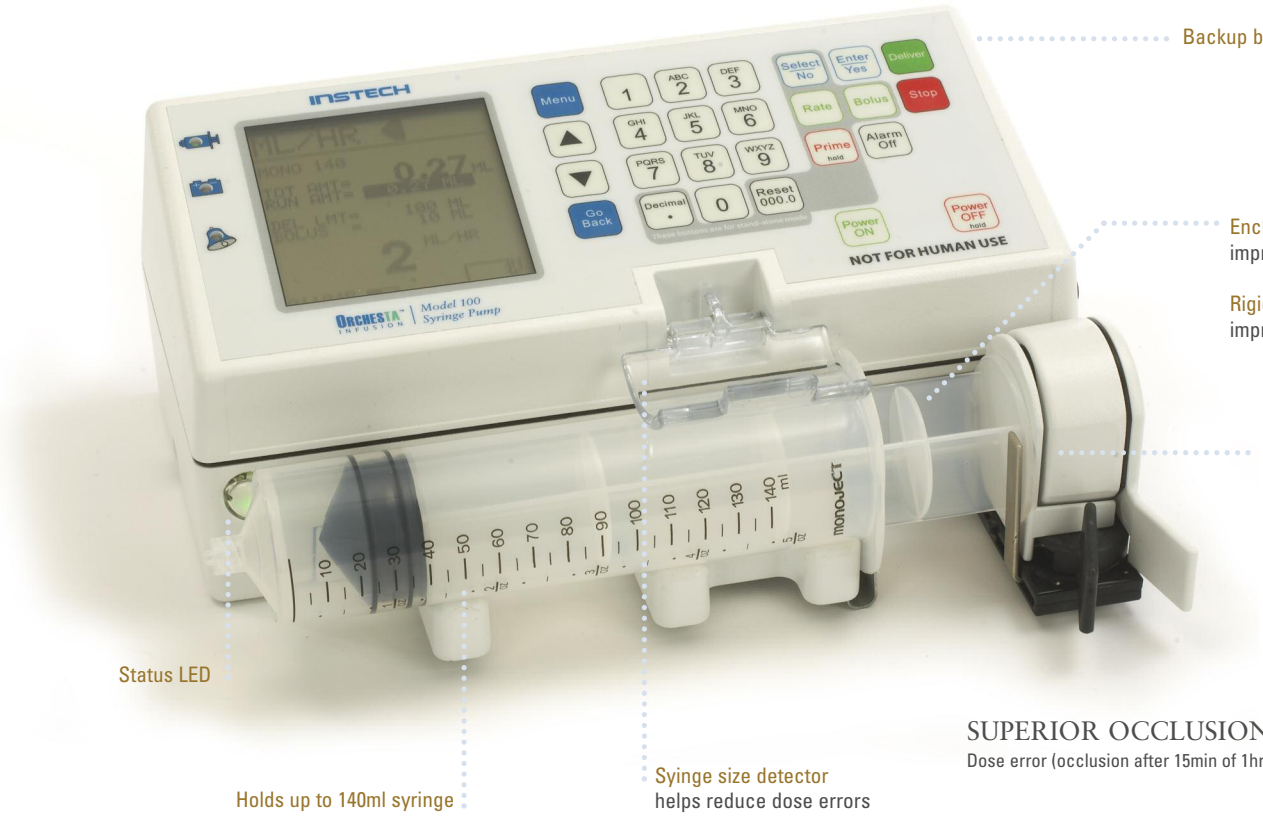
Operating System	Microsoft Windows® 7
Software versions	D – for model 100 syringe pumps G – for model 500 ambulatory pumps
Pumps per study	Up to 300
GLP compatible	Yes
21 CFR Part 11 compatible	Yes
Wireless network	IEEE 802.15.4
Wireless range	~30m (can be extended)
Channels	16
Encrypted	Yes

* US Patent no. 8,394,077

ORCHESTA™ SYRINGE PUMP

The OrchesTA model 100 syringe pump is a modern hospital pump with firmware that has been adapted for laboratory animal research. It can be used as a stand-alone pump or combined with an OrchesTA pump transceiver to create a network of pumps controlled by the OrchesTA™ Infusion Automation software.

Features that are most important for laboratory animal infusion include the ability to accept a 140ml syringe (it is the only clinical pump that can do this), superior performance when there is an occlusion in the line, a backup battery, and a lead screw that is not exposed to debris.



Backup battery

Enclosed lead screw improves reliability

Rigid metal construction improves accuracy

In-line force transducer senses occlusions faster than other pumps. Auto-backup on occlusion option reduces risk of unintended bolus when occlusion is cleared.

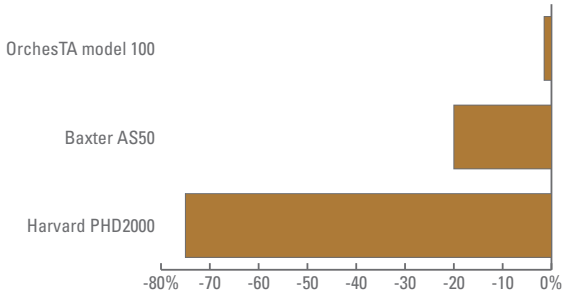
Status LED

Holds up to 140ml syringe

Syringe size detector helps reduce dose errors

SUPERIOR OCCLUSION PERFORMANCE

Dose error (occlusion after 15min of 1hr infusion, 2ml/hr, 3ml syr, rodents)[a]



SPECIFICATIONS

Accuracy	±3%, excluding syringe variations
Syringe sizes	1-140ml
Syringe detection	Automatic
Syringe types	Becton Dickinson (plastic and glass), Monoject, Terumo, Nipro, others
Flow rates	0.01 – 3,000 ml/hr (depends on syringe)
Backup battery	~12 hours
Occlusion sensor	In-line force transducer
Occlusion back off	Automatic
Dimensions	24x10x15cm
Weight	2.2kg
Power	120VAC, 115mA, 50/60Hz or 240VAC, 90mA, 50/60Hz
CE Mark	Yes

NOTE: The OrchesTA model 100 version of this pump is not approved for human use.

[a] J Sommers, Presentation at ITO Conference, Cologne Germany, September 2015.

Part No.	Description
OR-100-0001	OrchesTA model 100 syringe pump, 120V, US cord
OR-100-0002	OrchesTA model 100 syringe pump, 240V, UK cord
OR-100-0003	OrchesTA model 100 syringe pump, 240V, Euro cord
OR-100-0901	Pump clamp for round poles (2.2-2.9cm in diameter)
OR-100-0902	Pump clamp for square poles (2.2-2.5cm wide)
OR-100-1001	PT100 wireless transceiver for model 100 pump
OR-100-1080	PCT200 PC transceiver, for model 100 pumps

ORCHESTA™ AMBULATORY PUMP

Weighing only 180g, the OrchesTA model 500 pump (formerly Pegasus) is one of the most versatile pumps for ambulatory animal infusion. The peristaltic mechanism uses cost-efficient tube sets to deliver 0.1-100 ml/hr pulling from drug bags ranging from 50 to 300ml. The pumps are typically placed in the pocket of a Lomir jacket and the drug bag can be protected in a box.

Connect the model 500 pump with a cable to an OrchesTA pump transceiver and you can now control and monitor your infusion study remotely—limit human interaction with the animals, automate repetitive tasks and reduce the opportunities for programming and documentation errors.

Ideally suited for ambulatory infusion when placed in a jacket pocket. IV access is typically made through a subcutaneous port.

SPECIFICATIONS

Pump type	Linear peristaltic
Flow rates	0.1-100ml/hr
Accuracy	±5%
Pulse size	7µl
Alarms	Occlusion, bag empty, battery, others
Alarm mute	Yes
Battery	2 x AA
Battery life	~1000ml with 3000mAh lithium batteries
Dimensions	8.7x6.4x3.3cm
Weight	180g with batteries
CE Mark	Yes

NOTE: The OrchesTA model 500 version of this pump is not approved for human use.

Part No.	Description
OR-500-0001	OrchesTA model 500 peristaltic pump (PEGA® LAB; 0.1-100ml/hr)
OR-500-1000	OrchesTA model 500 peristaltic pump tube (PEGA® tube 10255)
OR-500-1205	OrchesTA model 500 drug bag, PVC, 50mL (PEGA® bag 14050)
OR-500-1210	OrchesTA model 500 drug bag, PVC, 100mL (PEGA® bag 14100)
OR-500-1215	OrchesTA model 500 drug bag, PVC, 150mL (PEGA® bag 14150)
OR-500-1230	OrchesTA model 500 drug bag, PVC, 300mL (PEGA® bag 14300)
OR-500-1405	OrchesTA model 500 plastic box for 50ml drug bag (PEGA® box 10405)
OR-500-1410	OrchesTA model 500 plastic box for 100ml drug bag (PEGA® box 10410)
OR-500-1415	OrchesTA model 500 plastic box for 150ml drug bag (PEGA® box 10415)
OR-500-1003	OrchesTA PT500 wireless transceiver for model 500 pump
OR-500-1080	OrchesTA PCT200 PC transceiver, programmed for model 500 pumps

Drug bags

Protective boxes attach to the bottom of the pump

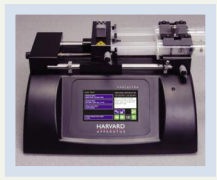
HARVARD APPARATUS SYRINGE PUMPS

Syringe pumps are the gold standard in laboratory animal research thanks to their ability to deliver low flow rates with high accuracy. As part of a twenty-four-year-old corporate partnership, Instech is proud to offer the complete line of pumps from Harvard Apparatus, the leading manufacturer of syringe pumps for life science research.

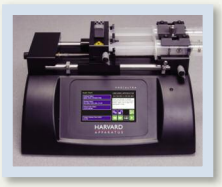
Harvard Apparatus's current pump models are the Pump 11 Elite and the PHD Ultra™. They feature improved flow specifications and an easy-to-use graphical user interface. With the exception of the PHD2000 series (see our website for details), older models of Harvard pumps were discontinued in 2014.

CHOOSING A PUMP

If you need...

A simple, easy-to-use pump for drug infusion infusion with one or two syringes	A simple dual syringe pump with smooth flows at the low rates required for microdialysis	The most advanced pump for complex flow profiles, multiple syringes, widest flow rate range, high force
PUMP 11 ELITE	PICO PLUS ELITE	PHD ULTRA SERIES
		

SPECIFICATIONS

	 11 ELITE	 PICO PLUS ELITE	 PHD ULTRA
Accuracy, excluding syringe variability	0.50%	0.35%	0.25%
Step Resolution (smoothness of flow)	0.069µm/µstep	0.013µm/µstep	0.005µm/µstep
Pusher Travel Rate			
- minimum	0.15µm/min	0.02µm/min	0.18µm/min
- maximum	159mm/min	72mm/min	191mm/min
Syringe Size Range	0.5µl-60ml (-10ml dual)	0.5µl-10ml	0.5µl-140ml
Flow Rate			
- minimum	1.28pl/min (0.5µl syringe)	0.54pl/min (0.5µl syringe)	1.56pl/min (0.5µl syringe)
- maximum	88ml/min (60ml syringe); 26ml/min (10ml)	12ml/min (10ml syringe)	221ml/min (140ml syringe)
Linear Force (at 100% force selection)	16kg	16kg	34kg
Adjustable Force	Yes	Yes	Yes
Syringe Lookup Table	Yes	Yes	Yes
Display	Color touch screen	Color touch screen	Color touch screen
Power supply	12-30VDC; 100-240VAC 50/60Hz input	12-30VDC; 100-240VAC 50/60Hz input	100-240VAC, 50/60Hz
Dimensions / Weight	23x18x15cm / 2.1kg	23x18x15cm / 2.1kg	31x22x18cm / 4.5kg
Part Numbers			
Infuse Only			
- single syringe	HA1100	-	-
- dual syringe	HA1100D	-	HA3000I
Infuse / Withdraw			
- single syringe	-	-	-
- dual syringe	-	-	HA3000W
Programmable Infuse/Withdraw			
- single syringe	HA1100W	-	-
- dual syringe	HA1100WD	HA1100DU	HA3000P
Syringe Rack Upgrade Kits			
- 6/10 (10x 0.5µl-20ml or 6x 30-60ml)	-	-	HA3020A
- 4x140 (4x 30-140ml)	-	-	HA3021A
- microliter (4x 0.5µl-10ml, various sizes at once)	-	-	HA3022A

Add 'E' to the end of the part number to specify a European power cord.

These high-performance pumps will meet most laboratory animal research needs. An LCD color touch screen with icon-based software makes set up, control and monitoring simple. Flow performance specifications, including reproducibility, flow rate range and smoothness of flow, are all improved over the predecessor Pump 11 series. The maximum linear force has been doubled to 16kg, and may be adjusted from 100% down to 20% to avoid damaging delicate glass syringes.

The pump's firmware can be upgraded remotely, and FlowControl™ software is available for computer control.

There are five models to choose from:

- Infuse only, single syringe (HA1100). Holds one syringe of 0.5µl-60ml and pumps forward only. Select syringes from a lookup table, enter flow rates and target volume or time. Includes footswitch and USB connectors.
- Infuse only, dual syringe (HA1100D). As above but holds 2 syringes of 0.5µl-10ml (both are pushed at the same rate).
- Programmable, single syringe (HA1100W). Holds one syringe of 0.5µl-60ml and can infuse or withdraw. Create and store 2 user-defined methods of up to 50 steps each. Methods can be saved to a computer and transferred to other pumps. Includes footswitch, USB, RS-485 and digital I/O connectors.
- Programmable, dual syringe (HA1100WD). As above but holds 2 syringes of 0.5µl-10ml.
- Pico Plus Elite (HA1100DU) A programmable, dual syringe model optimized for smooth flow at the lowest flow rates. Ideal for microdialysis.

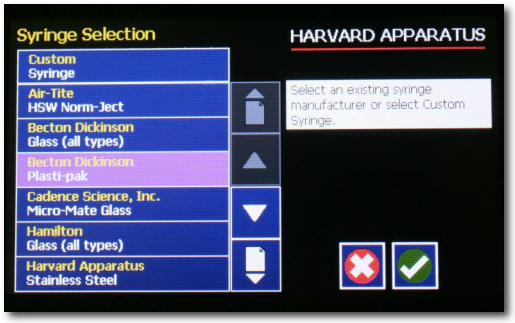
Syringe Racks

Single 0.5µl to 50/60ml

Dual 0.5µl to 10ml

User Interface

Infuse Only Models



Select syringe from a lookup table using the touch screen.

Enter flow rate and target volume or time.

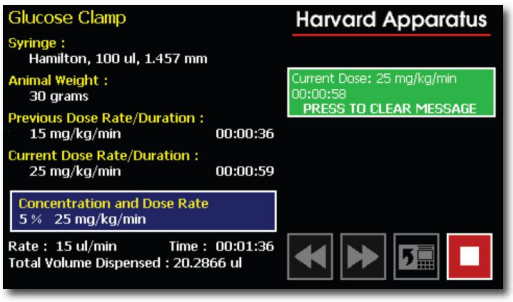
Monitor infusion progress.

$ www.instechlabs.com/Pumps/syringe/11elite.php

PUMP 11 ELITE

Programmable Infuse/Withdraw Models

Use a programmable 11 Elite when you need to do more than simply infuse at one rate. Select standard infuse or withdraw Methods or set up a custom Method that can contain up to 50 separate steps. Gradient, ramp and autofill profiles are available (see manual online for details). Custom methods can be saved to a PC or transferred to other pumps.



Programmable pumps include a Glucose Clamp Method that can be uploaded from a PC or preinstalled on request. Enter the animal weight, concentration and dose rate and the pump will calculate the infusion rate. Change the dose rate on the fly without stopping the pump (not possible in other Methods or with Infuse Only pumps). The previous rate and duration are displayed to aid record keeping.

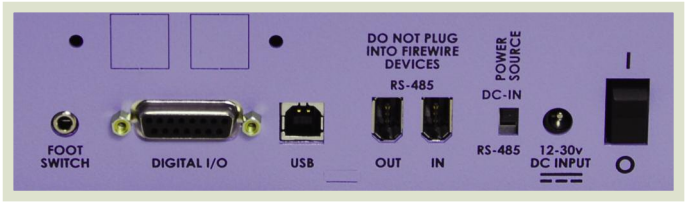
The touchscreen on all 11 Elites can be rotated so that you can orient the pump vertically to save benchtop space and allow gravity to clear air bubbles. (Shown here on a rack configured for infusion and automated blood sampling.)

Connectivity

Infuse Only Models

The HA1100 and HA1100D models include a footswitch input (for starting and stopping the pump) and USB conector for connection to a PC (to update firmware or for use with FlowControl or user created software).

Programmable Infuse/Withdraw Models



The HA1100W, HA1100WD and HA1100DU models add RS-485 connectors for pump-to-pump connections (including the option of power via RS-485) and a digital I/O connector.

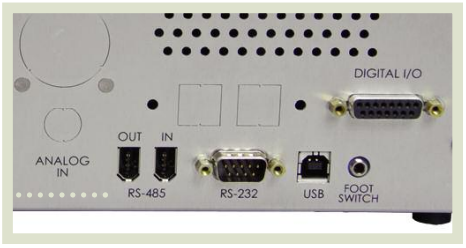
The PHD Ultra series of pumps raises the bar set by the PHD2000 series. The software behind the touchscreen interface includes templates and wizards to simplify the most complex tasks. A redesigned pump mechanism delivers the best performance yet in a laboratory syringe pump, and several other new features make it easier to use and more versatile.

The Ultra pumps are available in a full range of configurations, including infuse-only to fully-programmable, multi-syringe racks, push/pull mechanism, high force motors, and remote pump control.

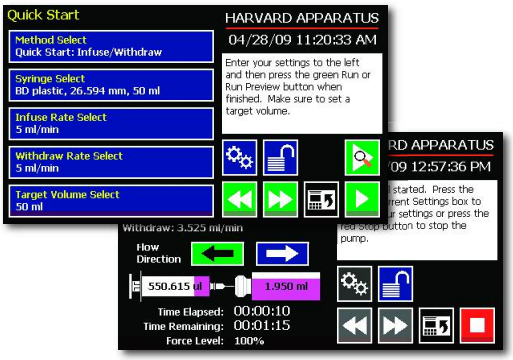
FEATURES

Advanced mechanism achieves the smoothest flow and highest accuracy across the broadest range of rates. Also provides the highest force of any Harvard pump model.

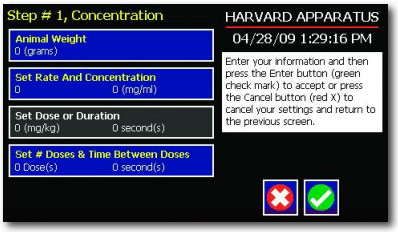
Vertical or horizontal operation lets you choose the orientation that is best for your experiment; it can minimize dead volumes or make it easier to clear air bubbles.



More connectivity options than ever before, including USB and RS-232 for computer control, RS-485 to daisy-chain pumps, a footswitch input, a 15-pin I/O connector, an optional analog input, and optional legacy RJ11 RS-232 connectors.



Graphical touchscreen interface simplifies both basic operation and advanced programming.



Concentration mode streamlines set up when dose is specified in mg/kg and rate varies by animal weight.

$ www.instechlabs.com/Pumps/syringe/phdultra.php

PHD ULTRA™

Functionality

Infuse Only. Ideal for applications such as microdialysis that require high accuracy and low flow rates without the need for fluid withdrawal or complex protocols. While they are not fully programmable, the pumps can be set to deliver a target volume.

Infuse/Withdraw. The lead screw on these pumps can reverse direction to withdraw fluid and refill the syringe.

Programmable. Use programmable pumps to administer complex protocols. For example: deliver a bolus then ramp down to a steady infusion rate; deliver doses of a drug several times a day for several weeks on end; deliver a small dose of a potent drug, then send a TTL signal to a separate pump to flush saline through the line. Non-volatile memory stores up to four programs of nine sequences. All programmable Ultra pumps are capable of infusing and withdrawing.

	INFUSE ONLY	INFUSE/ WITHDRAW	PROGRAMMABLE
Standard	HA3000I	HA3000W	HA3000P
Push/Pull	-	HA3000W/P	HA3000P/P
Continuous	-	-	HA3000P/C
Remote	HA3000IR	HA3000WR	HA3000WP
Push/Pull Remote	-	HA3000WR/P	HA3000PR/P
High Pressure Remote	-	-	HA3000PRX

$ http://www.instechlabs.com/Pumps/syringe/phdultra.php

Add 'E' to the end of the part number to specify a European power cord.

HA3000P with HA3020A 6-10 multirack. Can be used for simultaneous infusion of multiple animals.

Syringe Racks

Standard PHD Ultras include a built-in two-syringe rack that can handle syringes from 0.5µl to 140ml in size. There are three multi-syringe rack upgrade options:

6 to 10 Rack. Holds ten 0.5µl to 20ml syringes or six 30ml to 60ml syringes.

4 x 140 Rack. Holds four 30ml to 140ml syringes.

Microdialysis Rack. Holds four 0.5µl to 10ml syringes. Independent thumb screws let you infuse with different sized syringes simultaneously.

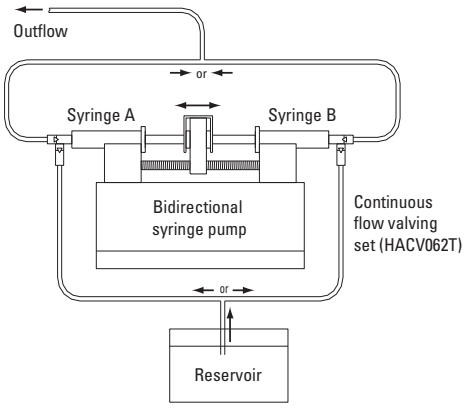
Order the rack upgrade separately using the part numbers below. When ordered at the same time as a pump, use the part numbers below with an 'A' at the end for a significant discount.

Part No.	Description	Unit
HA3020A	Add-on 6-10 multi syringe rack for PHD Ultra	ea
HA3021A	Add-on 4x140 multi syringe rack for PHD Ultra	ea
HA3022A	Add-on microdialysis syringe rack for PHD Ultra	ea

Special Configurations

Push-Pull / Continuous Flow. Holds four syringes from 0.5ml to 60ml, two in each direction. Set up as a push/pull pump, it can infuse and withdraw the same amount simultaneously. Use it when you don't want an infused or sampled volume to alter blood pressure. When combined with Instech's special valving system, it becomes a continuous flow syringe pump. Finally, no limits on the delivered volume from a syringe pump!

Continuous Flow Syringe Pump. Syringe A empties while B fills, then the process reverses, providing continuous outflow except for a slight pause at the transition.



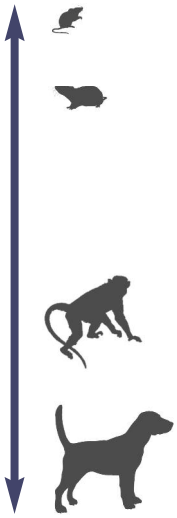
Remote Control. When working with hazardous materials use the remote control configuration to put up to 30 feet between the pump mechanism and the control box. Available with most configurations.

Ultra-High Pressure Remote. The HA3000PRX model can handle four 50 to 200ml stainless steel syringes and pump with 433lbs (197 kg) of linear force, nearly six times that of the standard models. Remote control with a 5 foot cable is standard.

AUTOMATED BLOOD SAMPLER

Instech's ABS2™ automates the collection of blood samples from laboratory animals. By eliminating labor-intensive manual withdrawals it can increase the throughput of pharmacokinetics research groups. It can also reduce the stress on animals caused by handling and venipuncture.

The sampler withdraws blood from a tethered freely-moving animal according to your programmed schedule, stores the samples in an integrated refrigerated fraction collector, and replaces the withdrawn volumes with IV fluid. You control and monitor sampling schedules, volumes and withdrawal rates for up to twelve animals from a central computer.



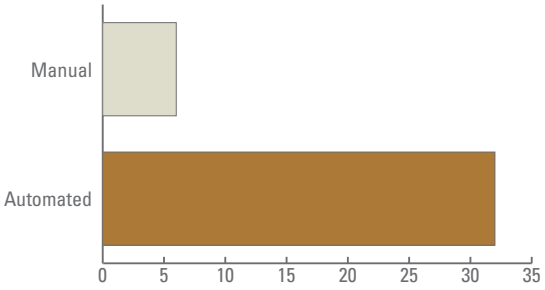
The ABS2 can sample blood from a wide range of species—from mice to rats to large animals.

It can collect a complete PK profile from a single mouse[a,b], leading to better data and a dramatic reduction in animal use compared to composite sampling.

3Rs

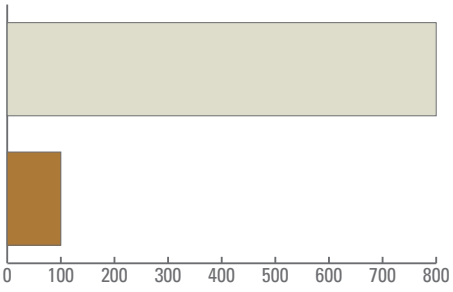
HIGHER THROUGHPUT

Compounds tested per week per technician[c,d]



LOWER STRESS

Adrenaline (pg/ml), rats[c]



[a] Uyeda C., Fide S. et al, Amgen Inc, "Evaluation of Automated Blood Sampling for Low Volume Serial Sampling and Dried Blood Spot Pharmacokinetic Applications in Mouse and Rat," poster P218 at AALAS conference, San Diego CA, 4 October 2011.
[b] Kenny J. et al, Merck & Co. Inc., "Utilization of Mouse Automated Blood Sampling (ABS) for Serial Plasma Pharmacokinetic (PK) Studies," poster presentation at AALAS TriBranch Symposium, Atlantic City, 9 June 2015.
[c] Galgosi A., Merck & Co., "Automated Blood Sampling in Rats; Practical Considerations," presentation at Harlan DMPK Seminar, Frankfurt Germany, 8 June 2011.
[d] Customer interviews.

AUTOMATED BLOOD SAMPLER

ABS Hardware

Instech's second-generation sampler, the ABS2™, builds on the proven foundation of precision peristaltic pumps for efficient fluid movement and in-line sensors to ensure successful collection of pure blood. The integrated refrigerated fraction collector has been redesigned from the ground up for added features and high reliability.

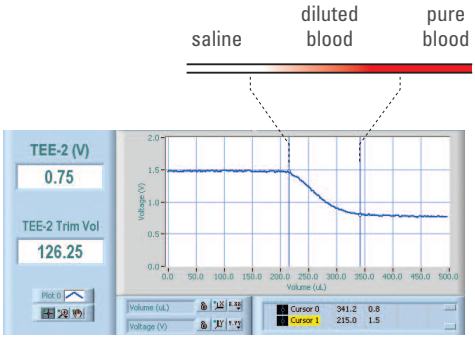
Integrated fraction collector holds 10 samples at 4-6°C. The rotary configuration allows wells to be reused as early samples are removed. Collector temperature is displayed on the monitoring computer.

Precision peristaltic pumps move fluids directly to their destinations without valves. The short, direct flow path means less mixing of blood and saline for faster collection and closer time points.

Removable carousel with numbered positions simplifies transport and identification of samples. Carousel is keyed so that the sampler will always place the first sample in position 1.

Dried blood spot disks with Whatman FTA® DPMK-C paper can be used simply by changing the carousel.

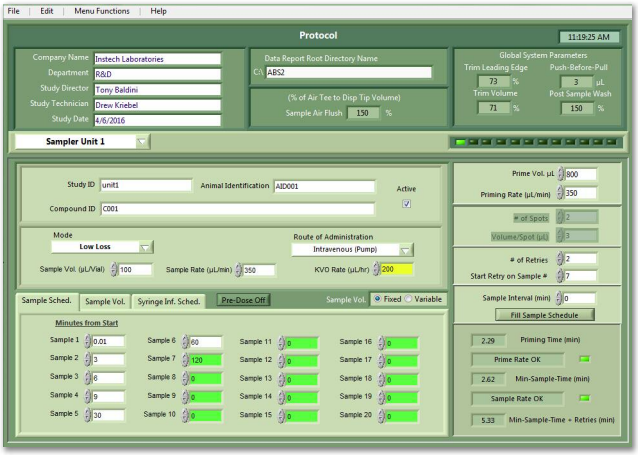
In-line sensors measure the fluid conductivity to distinguish between pure blood and saline to ensure that samples are undiluted whole blood. The sensors can even be used to monitor hematocrit in real-time.



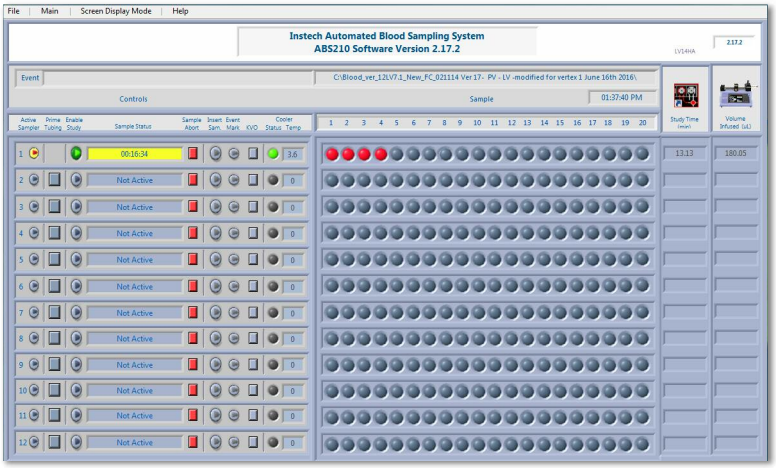
Low-loss reservoir stores the diluted leading edge of a sample so that it can be returned to the animal, cutting wasted blood from 40-80µL to just 2-4µL per sample.

ABS Software (Pharmacokinetics)

Refined over fifteen years of working with DMPK research groups, Instech's easy-to-use ABS software is used to set protocols, monitor study progress and change system parameters.



Program the sample times, volumes, rates and other study parameters for each sampler independently or apply a single protocol to all samplers. The volume of each sample can be set independently to minimize the total volume taken when some time points require extra analysis.



Control and monitor up to 12 samplers from a single PC. The main screen displays critical parameters for all units in real time, including which samples have been collected, unit status, cooler temperature and tee sensor readings.

Recent software enhancements include control of Harvard Apparatus 11 Elite syringe pumps for coordinated administration of IV compounds and the option to have the ABS collect pre-dose samples. NEW

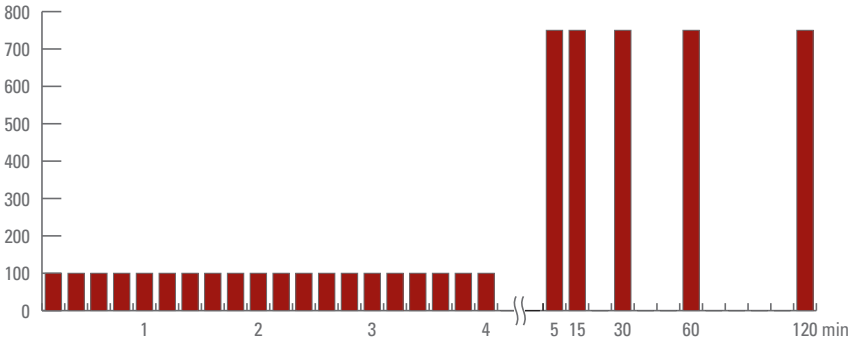
ABS Software (PET Sampling)

Instech has developed a special version of the software to control a single ABS210P blood sampler in order to take blood samples from an anesthetized animal (rats or large animals) in a PET scanner following administation of radio-labeled compounds.

Automating blood collection in PET studies can increase the number of samples taken, leading to more accurate determination of peaks, while reducing handling of radioactive blood.

TYPICAL PET SAMPLING PROFILE (NON-HUMAN PRIMATES)

Sample volume, µL



The software will first run the unit in a high-speed sampling mode, collecting as many as 20 samples of 20-100µL in 4-5 minutes, then it will autuomatically switch to a standard PK sampling mode, taking up to 20 samples over 24 hours or more.

AUTOMATED BLOOD SAMPLER

ABS2™ SPECIFICATIONS

Sample collection options	Greiner MiniCollect® tubes, 1.5ml Eppendorf-style centrifuge tubes, DBS disks with Whatman FTA® DMPK-C paper
Fraction collector type	Rotary, 10 position; additional samples can be collected once initial samples are removed
Sample storage temperature	4-6° C, displayed on control screen in real-time (room temperature in DBS mode)
Max. number of time points	20
Collection modes	Low Loss, No Low Loss, DBS Low Loss, DBS No Low Loss, Large Animal, Bile Collection
Auto-retry routine	Skips to next sample if user settable number of retries fail to pull in blood
KVO feature for catheter patency	Adjustable from 0-999 µL/hr; 5 µL per pulse
Push-before-pull volume for catheter patency	Adjustable from 5-50µL
Time to take one sample	Varies based on catheter and tubing volume and parameter settings (typically 3-5 min)
Sample volume	Adjustable for each time point
Minimum sample volume	10µL
Maximum sample volume	1ml (MiniCollect), 1.5ml (Eppendorfs), 25µL (DBS)
Max # of 100µL samples from a rat[a]	33
Max # of 15µL samples from a mouse[a]	18
Sample dilution	None
Recommended IV fluid	Normal saline with 10-20 units heparin per ml
Volume of blood withdrawn per sample	Sample volume plus typically 40-80µL; all but sample volume plus 2-4µL returned to animal; sampled volume replaced with IV fluid
Tee blood sensors	Electrical impedance technology
Computer system requirements	PC or laptop with Windows 7, >2Gb RAM, USB port
Maximum # of samplers per computer	12
Communication method	USB via RS-232 converter
Power supply	12VDC, 5A; 100-240 VAC input, 47-63 Hz
Power consumption	Less than 50W per unit, excluding computer; UPS recommended
Weight	5 kg (11 lbs)
Dimensions (WxDxH)	20 x 25 x 13 cm (8 x 10 x 5 in)

[a] Based on limit of 15% of animal's blood volume from NIH Guidelines for Survival Bleeding of Mice and Rats (Feb 2001). Assumptions: blood volume of 22 ml in 350g rat, 2.2 ml in 30g mouse; trim loss of 3 µL in Low Loss mode.

Blood Collection Tubes

Instech supplies the full range of MiniCollect® blood collection tubes from Greiner bio-one. These tubes are ideal for use with Instech's automated blood sampler due to the shape of the tube, which simplifies pipetting, and the wide range of additives and fill volumes.

The ABS/V080C-LIHEPG and ABS/V080C-SCAG models contain a unique inert acrylic gel at the bottom of the tube, under the additive, that moves upward during centrifugation to form a stable barrier between the cells and the plasma.

Part No.	Description
ABS/V100C-K3EDTA	1ml, K3EDTA, lavender, cap (450474)
ABS/V050C-K3EDTA	0.5ml, K3EDTA, lavender, cap (450475)
ABS/V025C-K3EDTA	0.25ml, K3EDTA, lavender, cap (450476)
ABS/V050C-K2EDTA	0.5ml, K2EDTA, lavender, cap (450480)
ABS/V100C-LIHEP	1ml, Li heparin, green, cap (450477)
ABS/V080C-LIHEPG	0.8ml, Li heparin, gel, lt green, cap (450479)
ABS/V100C-NACIT	1ml, sodium citrate, blue, cap (450413)
ABS/V100C-SCA	1ml, serum clot activator, red, cap (450470)
ABS/V080C-SCAG	0.8ml, serum clot activator, gel, gold, cap (450472)

Ⓢ www.instechlabs.com/Infusion/bloodsampling/greiner_minicollect.php

TUBING REFERENCE CHART

GAUGE

For swivels, needles, connectors, ports and cannulae

Gauge	OD (in)	OD (mm)	ID (in)	ID (mm)	Volume (µl/cm)
15TW	0.072	1.83	0.061	1.55	18.9
15	0.072	1.83	0.054	1.37	14.8
16TW	0.065	1.65	0.054	1.37	14.8
16	0.065	1.65	0.047	1.19	11.1
17TW	0.058	1.47	0.048	1.22	11.7
17	0.058	1.47	0.042	1.07	8.99
18TW	0.050	1.27	0.039	0.99	7.70
18	0.050	1.27	0.033	0.84	5.54
19TW	0.042	1.07	0.033	0.84	5.54
19	0.042	1.07	0.027	0.69	3.74
20TW	0.036	0.91	0.026	0.66	3.42
20	0.036	0.91	0.024	0.61	2.92
21TW	0.032	0.81	0.023	0.58	2.64
21	0.032	0.81	0.020	0.51	2.04
22TW	0.028	0.71	0.020	0.51	2.04
22	0.028	0.71	0.016	0.41	1.32
22Q	0.028	0.71	0.006	0.15	0.18
23TW	0.025	0.64	0.017	0.43	1.45
23	0.025	0.64	0.013	0.33	0.86
24TW	0.022	0.56	0.015	0.38	1.13
24	0.022	0.56	0.012	0.30	0.71
25TW	0.020	0.51	0.012	0.30	0.71
25	0.020	0.51	0.010	0.25	0.49
26	0.018	0.46	0.010	0.25	0.49
27	0.016	0.41	0.008	0.20	0.31
28	0.014	0.36	0.007	0.18	0.25
29	0.013	0.33	0.007	0.18	0.25
30	0.012	0.30	0.006	0.15	0.18
31	0.010	0.26	0.005	0.13	0.12
32	0.009	0.24	0.004	0.10	0.08

TW=thin wall, Q=quartz-lined swivel channel

FRENCH

French scale defines catheter OD (3Fr = 1mm)

French	OD (in)	OD (mm)
1Fr	0.013	0.33
2Fr	0.026	0.67
3Fr	0.039	1.00
4Fr	0.053	1.33
5Fr	0.066	1.67
6Fr	0.079	2.00
7Fr	0.092	2.33

POLYURETHANE (PU)

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	OD (in)	OD (mm)	ID (in)	ID (mm)	Volume (µl/cm)
BTPU-010 (32ga)	0.010	0.25	0.005	0.13	0.13
BTPU-014 (1Fr)	0.014	0.36	0.007	0.18	0.3
BTPU-027 (2Fr)	0.027	0.69	0.017	0.43	1.5
BTPU-040 (3Fr)	0.040	1.01	0.025	0.64	3.2
VAHBPU-T25	0.037	0.94	0.017	0.43	1.5
VAHBPU-T22	0.055	1.40	0.024	0.61	2.9

SILICONE (SIL)

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	OD (in)	OD (mm)	ID (in)	ID (mm)	Volume (µl/cm)
BTSIL-025 (2Fr)	0.025	0.64	0.012	0.30	0.7
BTSIL-037 (3Fr)	0.037	0.94	0.020	0.51	2.0
BTSIL-047 (3.5Fr)	0.047	1.19	0.025	0.64	3.2
BTSIL-065 (5Fr)	0.065	1.65	0.030	0.76	4.5
BTSIL-085 (7Fr)	0.085	2.16	0.040	1.02	8.2

POLYETHYLENE (PE)

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	OD (in)	OD (mm)	ID (in)	ID (mm)	Volume (µl/cm)
BTPE-10	0.024	0.61	0.011	0.28	0.6
BTPE-20	0.043	1.09	0.015	0.38	1.1
BTPE-25	0.036	0.91	0.018	0.46	1.7
BTPE-50	0.038	0.97	0.023	0.58	2.6
BTPE-60	0.048	1.22	0.030	0.76	4.5
BTPE-90	0.050	1.27	0.034	0.86	5.8

CO-EXTRUDED PE/PVC

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	OD (in)	OD (mm)	ID (in)	ID (mm)	Volume (µl/cm)
BTCOEX-25	0.051	1.30	0.017	0.43	1.5
BTCOEX-22	0.064	1.60	0.024	0.61	2.9

FEP

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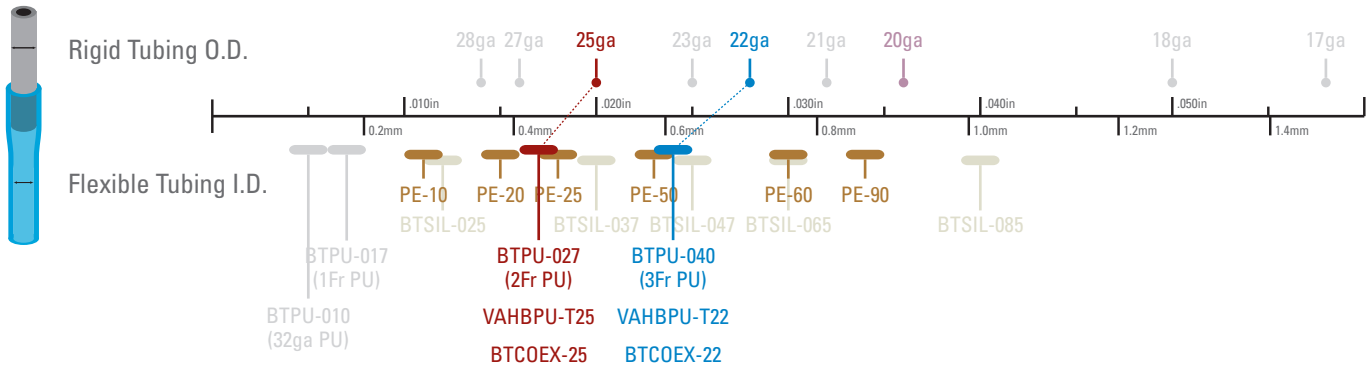
	OD (in)	OD (mm)	ID (in)	ID (mm)	Volume (µl/cm)
BFEP-T22Q	0.028	0.71	0.006	0.15	0.18

GUIDE TO TUBING FIT



Values are approximate; in particular IDs and ODs of extruded tubing can vary by ±.002in (.05mm) from nominal values. If dead volume is critical measure it directly by comparing weights of filled and empty samples.

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INSTECH

450 South Gravers Road
Plymouth Meeting, PA 19462
USA

TL 800-443-4227
TL 610-941-0132
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