



THE TOP IN QUALITY  
for all areas of healthcare

# TOP SYRINGE PUMP TOP-5520

Pump Technology for IV Anesthesia



High functionality  
in a single pump for  
both TIVA and PCA,  
thanks to new advances  
in IV anesthesia.

# Specifications

<b>Description</b>	TOP Syringe Pump	
<b>Model</b>	TOP-5520 (There are two models, each having a different voltage specification.)	
<b>Power Supply</b>	AC power supply	: AC 100-127V± 10% 50/60Hz (for 100V Area) AC 200-240V± 10% 50/60Hz (for 200V Area)
	External DC power supply	: DC9-15V 5W
	Internal battery	: Rechargeable, DC3.6V, 1500mAh Ni-MH (type BP-55). Battery life is approximately 12 hours (at flow rate of 5mL/h using new battery in fully recharged state)
	Alkaline batteries	: Uses four LR6 type, AA size alkaline batteries DC6V. Battery life is approximately 24 hours (at flow rate of 5mL/h using new batteries)
<b>Input Current</b>	AC power supply : 0.1A (for 100V Area), 0.05A (for 200V Area)	
<b>Applicable Syringe</b>	TOP, TERUMO, NIPRO, JMS, B-D, MONOJECT, and B. BRAUN syringes, plus one additional syringe registered by user per syringe size (10mL, 20mL, 30mL, and 50mL) 1% Diprivan Injection-kit 20mL, 50mL	
<b>Flow Rate Range</b>	TIVA mode	0.1 - 300.0 mL/h (10 mL syringe) 0.1 - 400.0 mL/h (20 mL syringe) 0.1 - 500.0 mL/h (30 mL syringe) 0.1 - 1200.0 mL/h (50 mL syringe, 1% Diprivan Injection-kit 20 mL, 50 mL) (settings adjustable in 0.1 mL/h increments) Rate limit setting at shipment shall be 150.0 mL/h without exception.
	PCA mode	0.1 - 150.0 mL/h (10 mL syringe) 0.1 - 150.0 mL/h (20 mL syringe) 0.1 - 150.0 mL/h (30 mL syringe) 0.1 - 150.0 mL/h (50 mL syringe) (settings adjustable in 0.1 mL/h increments) Set to " - - - - " for bolus infusion only. Rate limit setting at shipment shall be 150.0 mL/h without exception.
<b>Agent Range</b>	0.1 - 1000.0 mg	
<b>Solution Range</b>	0.1 - 1000.0 mL	
<b>Weight Range</b>	0.1 - 300.0 kg	
<b>Dosage Range</b>	TIVA mode	0.01 - 99.99 µg/kg/min 0.01 - 99.99 mg/kg/h
	PCA mode	0.1 - 99999.9 µg/h 0.1 - 9999.9 mg/h Set to " - - - - " for bolus infusion only.
<b>Volume Limit Setting</b>	0.1 - 1000.0 mL	
<b>Solution Range</b>	0.1 - 1000.0 mL	
<b>* Infusion accuracy</b>	Mechanical accuracy : ±1% Accuracy including the syringe : ±3% ■ For at least one hour of infusion at flow rate of at least 1.0 mL/h.	
<b>Purging</b>	Approximately 330.0 mL/h (10 mL TOP syringe) Approximately 620.0 mL/h (20 mL TOP syringe) Approximately 740.0 mL/h (30 mL TOP syringe) Approximately 1200.0 mL/h (50 mL TOP syringe, 1% Diprivan Injection-kit 20 mL, 50 mL)	
<b>Bolus Rate</b>	TIVA mode	300.0 mL/h (10 mL syringe) 400.0 mL/h (20 mL syringe) 500.0 mL/h (30 mL syringe) 1200.0 mL/h (50 mL syringe, 1% Diprivan Injection-kit 20 mL, 50 mL)
	PCA mode	[Basic flow rate] + 125 mL/h
<b>* Bolus Volume</b>	mL : 0.1 - 50.0 mL (0.1 mL steps) µg : 0.1 - 50000.0 µg (0.1 µg steps) mg : 0.1 - 5000.0 mg (0.1 mg steps)	
<b>* Occlusion Detection</b>	Can be set to any of four levels High : 93 ± 33 kPa (700 ± 250 mmHg / 0.95 ± 0.34 kgf/cm <sup>2</sup> ) Middle : 67 ± 27 kPa (500 ± 200 mmHg / 0.68 ± 0.27 kgf/cm <sup>2</sup> ) Low : 40 ± 20 kPa (300 ± 150 mmHg / 0.41 ± 0.2 kgf/cm <sup>2</sup> ) Very low : 20 ± 10 kPa (150 ± 75 mmHg / 0.2 ± 0.1 kgf/cm <sup>2</sup> ) ■ When using TOP dedicated syringe (50 mL) for the TOP syringe pump.	
<b>Overload Detection</b>	Unit : N (kgF)	Approximately 20N (2.0 kgf) or more : (10 mL syringe) Approximately 40N (4.0 kgf) or more : (20 mL syringe) Approximately 55N (5.0 kgf) or more : (30 mL syringe) Approximately 80N (8.0 kgf) or more : (50 mL syringe)
	Unit : Pa	Approximately 110kPa or more : (TOP 10 mL syringe) Approximately 115kPa or more : (TOP 20 mL syringe) Approximately 133kPa or more : (TOP 30 mL syringe) Approximately 120kPa or more : (TOP 50 mL syringe)
<b>Lockout</b>	1 - 120 minutes (one-minute steps)	
<b>Bolus Limit</b>	Time	1 - 24 hours (one-hour steps)
	No. of times	1 - 10 times (one-time steps)
	Total infusion volume	mL : 0.1 - 50.0 mL (0.1 mL steps) µg : 0.1 - 50000.0 µg (0.1 µg steps) mg : 0.1 - 5000.0 mg (0.1 mg steps)

<b>Alarms</b>	High priority alarm	*Occlusion, Overload, *Infusion complete, Power off, Power loss, *Malfunction, Syringe barrel clamp disengaged, Syringe plunger disengaged, Syringe barrel flange disengaged, *Infusion complete (KVO)
	Low priority alarm	Low volume, No battery, Low battery, Operation reminder alarm, Prior end alarm, No rate alarm, No volume limit alarm, No value in some fields alarm, Set value check alarm
	Information signal (warning)	Sensor Check, Maintenance timer, Standby mode, Power supply switched, Bolus cancel
<b>Special Functions</b>	Auto power off :	During battery operation, when the pump is left for three minutes with infusion stopped or in an alarm state, the buzzer sounds. When the buzzer has been left sounding for three minutes, the power shuts off automatically.
	Alarm reminder :	Unless the cause of an alarm is corrected within two minutes after the operator presses the Silence key, the alarm will sound again to remind the operator of the problem.
	Buzzer setting :	Presence / absence of wait tone and operation tone can be specified.
	Power supply switch alarm :	An alarm will sound when the AC power supply has stopped and the unit has switched over to battery operation.
	History function :	The history of infusion start / stop, alarm generation, bolus infusion, change of flow rate / dose while infusion is under way, power on / off can be checked.
	PCA history printout function :	The operation history of PCA switch can be printed out.
	Standby function :	The Remainder alarm can be temporarily reset.
	KVO function :	After infusion is completed, the device continues to operate at 0.1 mL/h to prevent thrombus.
	Key lock function :	During infusion, places the system in the Key Lock state.
	External communication function :	Pump state can be monitored.
Syringe brand limit function :	Selectable syringe brands can be limited.	
Infusion mode limit function :	Selectable infusion modes can be limited.	
Dose unit limit function :	Selectable dose units can be limited.	
Volume limit display switching function :	Whether volume limit is displayed can be specified.	
Battery refresh function :	Performs refresh operation in order to maintain the battery performance.	
Maintenance timer function :	When the preset timing has been reached, a screen to prompt regular inspection is displayed.	
Flow rate upper limit value setting function :	Flow rate upper limit value can be set.	
User syringe registration function :	A syringe not registered to this machine can be registered.	
<b>Operating Conditions</b>	Ambient temperature : 5 - 40 °C Relative humidity : 20 - 90 % (noncondensing) Atmospheric pressure : 70 - 106 kPa	
<b>Transport and Storage Conditions</b>	Ambient temperature : -20 - 45 °C Relative humidity : 10 - 95 % (noncondensing) Atmospheric pressure : 50 - 106 kPa	
<b>Service Life</b>	6 years [Based on self certification using TOP corporation data] assuming inspection and maintenance are carried out as indicated and consumable parts are replaced as needed.	
<b>Classification</b>	Class II  and Internally powered equipment, Type CF  , IPX2 (Drip proof)	
<b>Fuse</b>	T0.2AH	
<b>External Dimensions</b>	320 mm (Width) × 90 mm (Height) × 160 mm (Depth)	
<b>Weight</b>	Approximately 2.0 kg	
<b>Accessories</b>	AC power cable × 1, Remote PCA switch × 1, Operation Guide × 1	
<b>Composition</b>	Case : ABS (Acrylonitrile Butadiene Styrene) Syringe barrel clamp : Glass fiber-reinforced Polycarbonate (30%) Syringe plunger slider : Glass fiber-reinforced Polycarbonate (30%) Operation panel : Polyester film LED Cover : Methyl methacrylate polymer	

\*: Essential performance : critically affects the safety of patients if it is not operated according to specifications. (IEC/EN 60601-1-2)

## TOP Corporation

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