Fluent®

Automation Workstation.

SPECIFICATIONS

SYSTEM OVERVIEW

Instruments	Fluent 480	Fluent 780	Fluent 1080
No. of robotic arms	1–2	1–3[1]	1–3[1]

[1] Dual Flexible Channel Arms possible.

ROBOTIC ARMS AND OPTIONS

Flexible Channel Arms	8 pipetting channels, independent Z movement; automatic Y tip spacing from 9-38 mm
Disposable tip (DiTi) sizes	10, 50, 200, 1,000 µl – with or without filters; 10 and 350 µl – nested without filters
Tip Ejection System	Ejection of disposable tips in a contained environment to prevent aerosols. Also used for tip re–racking
Fixed tips	Standard, low volume 384-well and Te-PS tips (liquid displacement pipetting system only)
Rapid Wash	Ultra-fast delivery of wash solution by diaphragm pump (liquid displacement pipetting system only)
Flexible Channel Arm Gripper	Gripper tool picked up by disposable tip channels for certain plate moves within the deck
Multiple Channel Arm	Automatically interchangeable head adapters for 96- or 384-well formats, fixed or disposable tips, access from 1-384 tips, rows as well as specific, columns and quadrants
Disposable tips (DiTi) sizes	15, 50, 125 µl in 384-well format; 50, 100, 150, 200, 500 µl in 96-well format, with and without filters
Robotic Gripper Arm	Standard or long Z axes; regular gripper head or automatic Finger Exchange System gripper head, both with a choice of gripper fingers – eccentric, long eccentric, centric, tube; barcode reader option
Positive identification	Fluent ID high capacity barcode scanning of tubes; plate scanning

LIQUID HANDLING PERFORMANCE

Range	Less than 1 µl to over 1 ml depending on configuration
Performance parameters	Coefficient of variation (CV); Accuracy (ACC) measured at 20-25 °C/68-77 °F, relative humidity 30-60 % (non-condensing). Altitude ca. 500 m above sea level. Measurements obtained on standard Fluent instruments maintained according to system care instructions. Minimum of 96 measurements. The specified CV and average accuracy are the maximum values obtained overall and per channel.

FLEXIBLE CHANNEL ARM – LIQUID DISPLACEMENT PIPETTING[2]

Gravimetric measurement using deionized water in single pipetting mode under optimized conditions[3]; free dispense using 1,250 µl syringe

TIP TYPE	**DiTi 10**		**DiTi 50**		**DiTi 200**		**DiTi 350**		**DiTi 1,000**	
Volume (µl)	CV	ACC	CV	ACC	CV	ACC	CV	ACC	CV	ACC
0.5	≤ 8 %	± 10 %	-	-	-	-	-	-	-	-
1	≤ 4 %	± 5 %	≤ 6 %	± 8 %	-	-	-	-	-	-
10	≤ 1 %	± 2 %	≤ 1 %	± 2 %	≤ 1.8 %	± 2.5 %	≤ 2 %	± 2 %	≤ 2 %	± 3 %
100	-	-	-	-	-	-	≤ 0.3 %	± 1 %		
200	-	-	-	-	≤ 0.2 %	± 0.75 %	-	-	-	-
1,000	-	-	-	-	-	-	-	-	≤ 0.3 %	± 0.5 %

TIP TYPE/ SYRINGE	**STANDARD FIXED TIP 1,250 µl SYRINGE**		**LOW VOL FIXED TIP 250 µl SYRINGE**		**Te-PS TIP 250 µl SYRINGE**	
Volume (µl)	CV	ACC	CV	ACC	CV	ACC
0.2[4]	-	-	-	-	≤ 10 %	± 15 %
1	-	-	≤ 3.5 %	± 8 %	≤ 4 %	± 6 %
10	≤ 1.75 %	± 2.5 %	≤ 1 %	± 2 %	≤ 0.8 %	± 1 %
1,000	≤ 0.3 %	± 0.75 %	-	-	-	-

FLEXIBLE CHANNEL ARM – AIR DISPLACEMENT PIPETTING[2]

Gravimetric measurement using deionized water in single pipetting mode under optimized conditions[3]; free dispense

TIP TYPE	**DiTi 10**		**DiTi 50**		**DiTi 200**		**DiTi 350**		**DiTi 1000**	
Volume (µl)	CV	ACC	CV	ACC	CV	ACC	CV	ACC	CV	ACC
0.5	≤ 6 %	± 9.5 %	-	-	-	-	-	-	-	-
1	-	-	≤ 4 %	± 8 %	-	-	-	-	-	-
10	≤ 1 %	± 2 %	≤ 0.5 %	± 1 %	≤ 2 %	± 2 %	≤ 2 %	± 2 %	≤ 1.2 %	± 2 %
100	-	-	-	-	-	-	-	-	≤ 0.3 %	± 0.5 %
200	-	-	-	-	≤ 0.2 %	0.5 %	0.2 %	0.5 %	-	-

PERFORMANCE: MULTIPLE CHANNEL ARM[2]
Colorimetric measurement results in single pipetting mode under optimized conditions; contact dispense; 384-well format;

TIP TYPE	DiTi 15		DiTi 50		DiTi 125		15 µl FIXED WASHABLE TIPS		125 µl FIXED WASHABLE TIPS	
Volume (µl)	CV	ACC	CV	ACC	CV	ACC	CV	ACC	CV	ACC
0.25 DMSO	5 %	± 10 %	-	-	-	-	-	-	-	-
1 water[5]	≤ 3 %	± 5 %	≤ 4 %	± 5 %	-	-	≤ 8 %	± 10 %	-	-
10 water[5]	≤ 2 %	± 5 %	≤ 1 %	± 5 %	≤ 1 %[6]	± 5 %[6]	≤ 2 %	± 5 %	≤ 4 %	± 5 %
100 water[5]	-	-	-	-	≤ 1 %	± 5 %	-	-	≤ 2 %	± 3 %

[2)] Manufacturer's field CV guarantee: Liquid FCA standard volume range 10 µl ≤ 3 %, 100 µl ≤ 0.5 % / Liquid FCA low volume range 1 µl ≤ 8 %, 10 µl ≤ 1.5 % / Air FCA 1 µl ≤ 8 %, 10 µl ≤ 2 % / MCA 1µl ≤ 4 % [3)] Optimization may include single channel calibration for volumes ≤ 5 µl [4)] Contact dispense, Orange G [5)] Deionized water [6)] Also achieved with DiTi 200 (96-well format)

PROCESS CONTROL FEATURES

Liquid level detection	Down to 2 µl aqueous solution or 3 µl deionized water or 10 µl ethanol in a 96-well skirted PCR microplate with DiTi 10 Determination of presence of sufficient liquid; liquid arrival check
Real-time quality control	Aspiration supervision Tip diving prevention Tip occlusion detection Detection of disposable tip pickup and ejection
Positive identification	Barcode scanning for plates and tubes
Active Stop and Resume	User activated stop via door sensors on safety screen - resume on request
Door locks	Optional door locks protect process from free access

SYSTEM CONFIGURATION AND DIMENSIONS

Regulatory compliance	CE (2006/42/EU, 2014/30/EU and 2011/65/EU) and CSA marked; laser certification: IEC 60825-1:2014 and IEC 60825-1:2007		
Software options	Fluent Gx Assurance Software for laboratories in clinical diagnostics, GMP and other regulated environments. Introspect™ Software dashboards for tracking usage of liquid handling instruments and consumables.		
Operating system	Windows 7 and Windows 10 / 64 bit Professional		
Computer requirements	Intel®Core i7 processor or equivalent; minimum 4 GB RAM, 128 GB solid state hard drive; 1 USB port for instrument, monitor with vertical resolution of 1024 pixels, CD-ROM for software installation. Internet connections for remote support, printer and additional USB or serial interfaces as required by instrument options (optional).		
Footprint	Fluent 480	Fluent 780	Fluent 1080
Height (standard Z)	1,236 mm/48.6"	1,236 mm/48.6"	1,236 mm/48.6"
Height (long Z)	2,301 mm/90.6"	2,301 mm/90.6"	2,301 mm/90.6"
Width	1,150 mm/45.28"	1,650 mm/64.96"	2,150 mm/84.65"
Depth	785 mm/30.9"	785 mm/30.9"	785 mm/30.9"
Plate/tip box capacity (before stacking or nesting)	30	48	72
Precision of arm movement	± 0.1 mm on X,Y,Z axes		
Robotic Gripper Arm ranges	Standard and long eccentric fingers, centric fingers: 74–136 mm Tube gripper fingers: 8–60 mm Access below worktable (long Z): eccentric 685 mm; centric 438 mm Access below worktable (standard Z): eccentric 80 mm; centric 137 mm Z-hub: standard Z 335 mm; long Z 645 mm		
Supported barcodes types: Density Height Length (incl. QZ) Number of digits Quiet zone (QZ)	Code 128 (recommended), Code 39 standard, Codabar, Interleaved 2 of 5 Tube Barcodes ≥ 6.6 mil ≥ 8 mm ≤ 80 mm ≤ 64 ≥ 10 x narrow bar width or 2.5 mm, whichever is greater	 Plate Barcodes ≥3 mil ≥ 5 mm ≤ 80 mm ≤ 74	Fluent is a Class 2 Laser Product when equipped with the Fluent ID option 
Power requirements	Voltage: 100–240 V AC, frequency: 50/60 Hz		
Operating conditions	Temp. 15–32 °C/59–90 °F, relative humidity 30–80 % (non-condensing)		

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