

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

¹Dual 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, 5,000 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, Te-PS and Piercing 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 work table; maximum lift 0.4 kg (0.88 lb)
Multiple Channel Arm	The Multiple Channel Arm 96 and optional gripper offers: <ul style="list-style-type: none"> • Finger exchange system for landscape orientation transport of 96- or 384-well format plates • Disposable tips with individual cLLD • Volume range of 1 to 1,000 µl
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 5 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 PIPETTING²

Gravimetric measurement using deionized water in single pipetting mode under optimized conditions³; 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 PIPETTING²

Gravimetric measurement using deionized water in single pipetting mode under optimized conditions³; 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 ARM² (MCA)

Colorimetric measurement results in single pipetting mode under optimized conditions; MCA 384: contact dispense; plate format: 384-well; MCA 96: contact-free dispense; plate format: 96-well


TIP TYPE	MCA 384 DiTi 15		MCA 384 DiTi 50		MCA 384 DiTi 125		MCA 384 15 µl FIXED WASHABLE TIPS		MCA 384 125 µl FIXED WASHABLE TIPS		MCA 96 DiTi 10		MCA 96 DiTi 1000	
Volume (µl)	CV	ACC	CV	ACC	CV	ACC	CV	ACC	CV	ACC	CV	ACC	CV	ACC
0.25 DMSO	5%	± 10%	-	-	-	-	-	-	-	-	-	-	-	-
1 water²	≤ 3%	± 5%	≤ 4%	± 5%	-	-	≤ 8%	± 10%	-	-	≤ 4%	± 5%	-	-
2 water²	-	-	-	-	-	-	-	-	-	-	≤ 2%	± 5%	-	-
10 water²	≤ 2%	± 5%	≤ 1%	± 5%	≤ 1% ²	± 5% ²	≤ 2%	± 5%	≤ 4%	± 5%	≤ 1%	± 2%	-	-
20 water²	-	-	-	-	-	-	-	-	-	-	-	-	≤ 1%	± 4%
100 water²	-	-	-	-	≤ 1%	± 5%	-	-	≤ 2%	± 3%	-	-	≤ 1%	± 4%
500 water²	-	-	-	-	-	-	-	-	-	-	-	-	≤ 1%	± 1%
1000 water²	-	-	-	-	-	-	-	-	-	-	-	-	≤ 1%	± 1%

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 1 µl ≤ 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
DeckCheck	Camera-based system to assess the actual deck layout at run-time, compare to the expected deck layout and highlight any discrepancies.

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		
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 10 Enterprise LTSC 2019 (version 1809)		
Computer requirements	Intel® Core i7 processor or equivalent; minimum 32 GB RAM; solid state hard drive with 512 GB free space; NVIDIA GPU with minimum 5 GB RAM and CUDA node support; 750W power supply; two GiGE Network cards with Intel® chipsets (one for external network, one for DeckCheck); 1 USB port for instrument; monitor with vertical resolution of 1024 pixels. Internet connection for remote support (optional), printer and additional USB or serial interfaces as required by instrument options.		
	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
DeckCheck cameras	1	3	3
Precision of arm movement	± 0.1 mm on X,Y,Z axes		
Robotic Gripper Arm ranges	Gripper range: standard- and long- eccentric fingers and centric fingers: 74-135 mm (2.91-5.35"); tube fingers: 8-60 mm (0.32-2.36") Vertical range : standard Z 335 mm (13.19"); long Z 645 mm (25.39") Vertical access below worktable (standard Z): eccentric fingers 80 mm; centric fingers 137 mm Vertical access below worktable (long Z): eccentric fingers 385 mm ; centric fingers 438 mm Offset eccentric to centric fingers: Horizontal 53mm, vertical 152 mm Max transportable weight (eccentric fingers) 0.45kg (1.00 lb)		
Supported barcodes types:	Code 128 (recommended), Code 39 standard, Codabar, Interleaved 2 of 5 Tube Barcodes	Plate Barcodes	Fluent NAE (China only) is a Class 2 Laser Product when equipped with the Fluent ID option.
Density	≥ 6.6 mil	≥ 3 mil	
Height	≥ 8 mm	≥ 5 mm	
Length (incl. QZ)	≤ 80 mm	≤ 80 mm	
Number of digits	≤ 64	≤ 74	
Quiet zone (QZ)	≥ 10 x narrow bar width or 2.5 mm, whichever is greater		
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)		
Emissions	Instrument noise level < 60 dBA		

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Australia +61 3 9647 4100 **Austria** +43 62 46 89 330 **Belgium** +32 15 42 13 19 **China** +86 21 220 63 206 **France** +33 4 72 76 04 80 **Germany** +49 79 51 94 170
Italy +39 02 92 44 790 **Japan** +81 44 556 73 11 **Netherlands** +31 18 34 48 17 4 **Nordic** +46 8 750 39 40 **Singapore** +65 644 41 886 **Spain** +34 93 595 25 31
Switzerland +41 44 922 89 22 **UK** +44 118 9300 300 **USA** +1 919 361 5200 **Other countries** +41 44 922 81 11

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