

MASTERFLEX[®]

Gravimetric Filling System



Quick Overview

The Gravimetric Filling System consists of a Masterflex® peristaltic pump combined with an A&D Apollo series GX-A/GX-AE balance. Both units are connected by a unique A&D control interface that puts the balance in charge of the pump.

The Apollo series GX-A/GX-AE balance covers a full range of capacities and resolutions, that span from 120 grams to 10 Kg. Coupled with 1mg resolution. The system fills to 0.01 g accuracy.

Masterflex® peristaltic pump can transfer fluids from a container with a suction lift of up to 7 meters. Masterflex® tubing is FDA approved and USP Class VI (Pharmaceutical Grade), plus other approvals (over 20 variants of tubing to choose from).

The Masterflex® pump is low shear, moving the liquid in a very gentle and controlled way, and can be enhanced by a second Easy-Load II pump head (which has the benefit of reducing 95% of pulsation).

Who Needs Gravimetric Systems?

The Gravimetric system aims to solve many problems and challenges for lab technicians across numerous applications:

- Fluid handling/filling—from low to mid-flow volumes (mL to L)
- Anyone using a manual and volumetric led filling/dosing system
- Start-up labs requiring process filling
- Pharma-led labs (such as cosmetics or vaccines)
- Quality and testing labs who are involved with liquids and liquid movement
- Technicians/production engineers or supervisors who need to fill or dose a liquid
- Small-scale food production
- Academic labs such as chemistry/chemical engineering research departments

The most significant benefit of the Masterflex® Gravimetric Filling system is the repeatability of the system once it is set up, delivering accuracy time and time again.



Frequently Asked Questions

Is the firmware on the gravimetric filling system important?

The firmware in both the Masterflex L/S pump and the GX-A/GX-AE balances must be up to date to successfully operate the filling process. The pump requires 3.1.1 as the minimal firmware version. Please contact us if you are unsure about checking what version you have (if you have a pump already). If you already have an Apollo balance and wish to upgrade the firmware it will need to be returned to A&D (Abingdon office, UK).

How do you use gravimetric filling systems simultaneously?

Lab technicians can have several gravimetric systems running at the same time, as each one runs independently. This means a lab technician can start one system and be reassured that it will stop automatically when its filling process is complete while starting another. This reduces time spent monitoring each system while they are running. This is true whether the source is one container or several.

What range of dosing can the gravimetric filling system manage?

The system manages from 20mL up to 1500mL. It can be set-up to run smaller and larger filling requirements. Please contact us if you wish to use the system for doses outside of this scope.

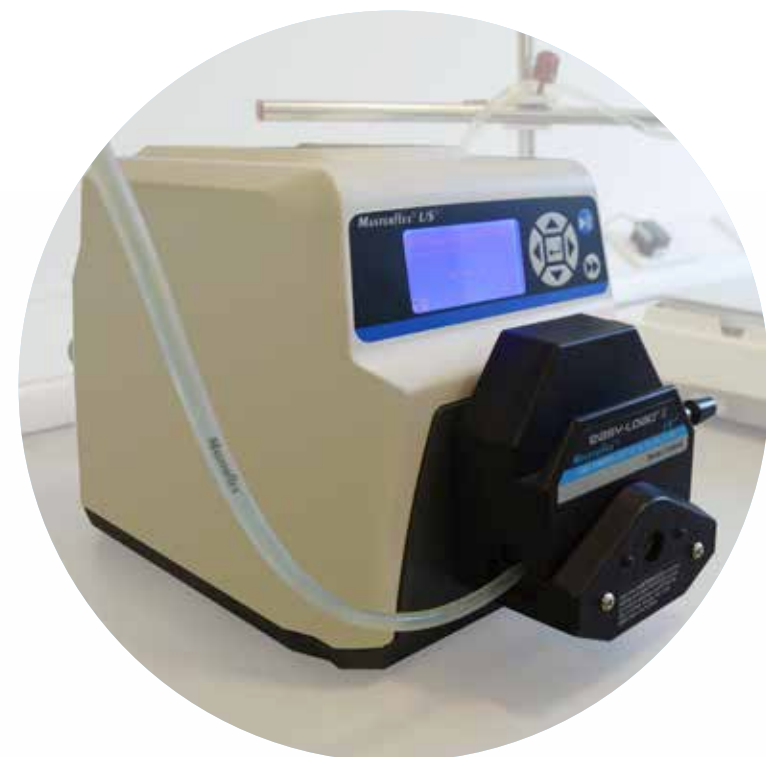
Can I order a gravimetric system if I already have an Apollo GX-A/GX-AE balance or Masterflex L/S digital pump?

Yes. We offer an upgrade kit that supplies the equipment you do not have to complete the gravimetric system. Please note you need to check the firmware on the pump and the balance to ensure it can be used.

MASTERFLEX®

Masterflex® L/S Peristaltic Pump

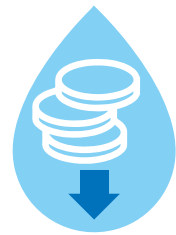
- Dispense by volume in mL, L, or gal.
- Anti-drip function ensures dispensing accuracy
- Flow rate 0.001/0.006 to 566/3400 mL/min with L/S tubing – flow rate depends on drive rpm, pump head, and tubing size



Masterflex® L/S® Pump

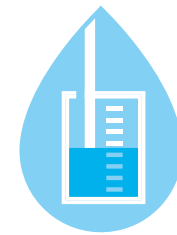


Accurate to the last drop



Decrease Cost

Reduce costs by optimising the fill to minimise wastage



Efficiency

Experience increased production of highly accurate fills



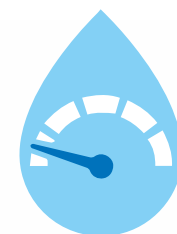
Automate

Semi-automated process, freeing up your time



Run Systems Simultaneously

Run several gravimetric systems at the same time, each one runs independently filling from one source container.



Reduce Risk

Tube/liquid containment can reduce health & safety risk. Minimise clean down with only a tube change! Prevent damage/contamination to the balance from spillage.



Upscaling & Scalability

Masterflex pumps can upscale from mid-flow L/S Series to B/T Series. Handling fluid transfer up to 40 LPM. A&D balances range from 120g to 10Kgs



A&D
Discover Precision

Apollo Balance



A&D Apollo Balance

- Range of capacities and resolutions from 120g x 1mg – 10.2kg x 10mg
- Semi or automated controlled filling using the balance's one-touch fill or integrated into a PC/PLC control system
- Data output via standard RS-232 or USB
- Complementary WinCT software supports data collection and statistical analysis
- Internal or external calibration options
- OIML, GLP/GMP, USP (USA Pharmacopeia) Minimum Weight, 21CFR (user access password control) compliant
- Gross/Net/Tare
- ISD – Impact Shock Detection system

Gravimetric Standard Kit

- 1 x Masterflex L/S Digital Drive, 600rpm, 115/230 VAC
- 1 x Masterflex L/S Easy-Load® II Head for Precision Tubing with Open-Head Sensor, PPS/SS
- 1 x Cole-Parmer Support Stand Stainless Steel with 28" Rod
- 1 x Cole-Parmer Clamp, Stainless Steel, 0 to 0.71" Dia Rod
- 1 x Cole-Parmer Two-Prong Extension Clamp, Dual Adjustment, Large, Stainless Steel
- 1 x Masterflex Pump Tubing, Puri-Flex™, L/S 16, 25 ft.
- 1 x Disposable filler nozzle, SS needle and polycarbonate base, 1/8" ID, Barb Connector
- 1 x A&D Apollo series GX-2002A Balance, 2.2kg x 0.01gms, 165mm Pan size
- 1 x A&D GXA-28 Control interface
- 1 x A&D AX-SW137-REZERO Footswitch

Masterflex® Easy-Load® II Pump Head

- Automatic tubing retention allows for multiple tubing sizes – change tubing without removing head from drive
- Four-roller rotor improves pressure performance and mechanical stability while reducing pulsation
- Model available with integrated open-head sensor connects directly to sensor-equipped drives
- Pump heads are stackable for multichannel applications
- Compact design for efficient use of space
- Suitable for use with L/S® Precision pump tubing sizes
- When two Easy-Load® II pump heads are stacked rollers are offset by 45°, combine the outlets for two stacked heads for a 95% reduction in flow pulsation



Easy-Load® II Pump Head Assembly

Technical Specifications

A&D Balance

Internal mass	For GX-A / GX-AE series
Ionizer (static eliminator)	For GX-AE series
Sensitivity drift (10°C to 30°C)	±2ppm / °C (When auto calibration is OFF)
Operating environment	5°C to 40°C, 85%RH or less (no condensation)
Display refresh rate	5 times/second, 10 times/second, or 20 times/second
Display mode (unit)	g (gram), oz (ounces), lb (pound), lb-oz (pound-ounce), ozt (troy ounce), ct (metric carat), mom (momme), dwt (penny-weight), gr (grain), pcs (counting mode), % (percent mode), SG (specific gravity), and a user-programmable unit
Count mode Number samples	5, 10, 25, 50 or 100 pieces
Percent mode (readability)	0.01%, 0.1%, 1% (Automatically changed by 100% mass)
Interface	RS-232C, USB
AC adapter	Confirm that the adapter type is correct for the local voltage and power receptacle type Power consumption: Approx. 30 VA (supplied to the AC adapter)

A&D Balance Dimensions

Resolution	0.0001g	0.001g	0.01g	0.1g
Weighing pan diameter	φ90 mm	128 x 128 mm	165 x 165 mm	
Mass of product	Approx. 7 kg	Approx. 5 kg	Approx. 5 kg	
External dimensions	259(w) x 358(D) x 332(H) mm (with glass breeze break)	212(w) x 317(D) x 171(H) mm (with small breeze break)	212(w) x 317(D) x 93(H) mm	

Masterflex® Peristaltic Pump

Description	L/S Digital Drive, 600 rpm		
Pump Series	L/S	No. Pump Heads Accepted	2
Control Type	Digital Variable Speed	Type of Pump Heads Accepted	Standard, Easy-Load
Min speed (rpm)	0.1	Motor (watts)	75
Max speed (rpm)	600	Drive IP rating	IP33
Speed	Variable	Power (VAC)	90 to 260
Speed Control	±0.1% (0.1 rpm at 600 rpm)	Power (amps)	2.2
Min Flow Rate (mL/min)	0.006	Open-Head Sensor	Optional
Max Flow Rate (mL/min)	3400	Power (Hz)	50/60
Reversible Motor	Yes	Housing Material	ABS Plastic and Aluminium
Digital Dispensing	Yes	Dimensions	Drive Length (in.) (mm) 10 / 254

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