

BOTTOM LOADING MODULES

DKI Bottom Loading Modules are designed and produced as a total 'turn key' solution. All modules are pre-fabricated and pre-tested to minimize site works.

All manufacturing and fit out are completed, inspected and tested under ISO9001 Quality Controlled procedure at Diamond Key International Works.

These modules integrate safety systems, hydraulic control, metering systems, pipework, electrical, instrumentation and load rack control equipment, all on a fully galvanised portable frame.

They can be readily transported to the implementation site and rapidly deployed.

DKI's modular solutions provide an excellent base for either a standalone loading bay or a fully automated terminal.

GANTRY FEATURES

General

The gantry is a self contained unit that houses all the devices and systems to provide loading of product from a tank to truck (less pumps). Lifting lugs are provided for crane use.

Truck Connection

Single 4" female API coupling per loading arm for connection to the truck.

Additives

Additive controllers are connected to the Load Controller via serial communications. The maximum number of additive per loading controller (AccuLoad III) is twenty four.

3 Additive Injection Points standard per arm, optional up to maximum per controller (24) shared amongst arms.

Vapour Removal

Vapour removal components complete with frame arrestor and intrinsically safe interlock sensors.

Safety

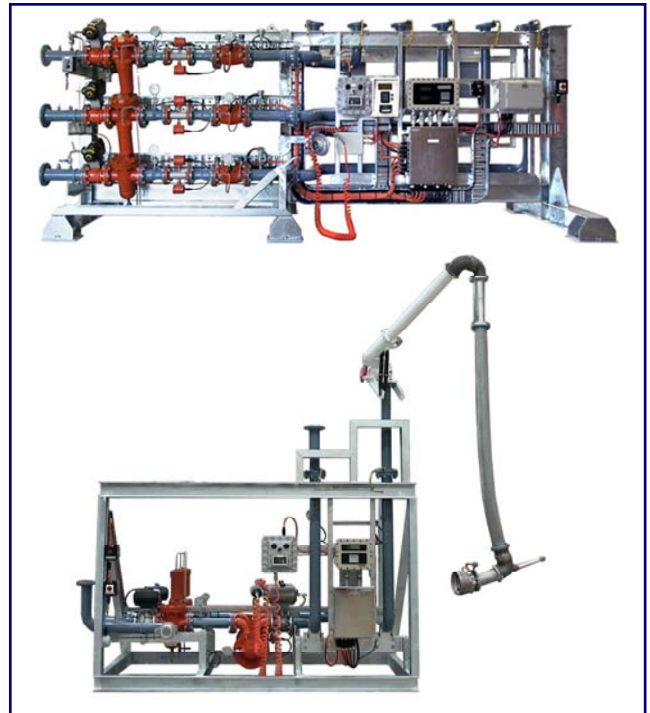
Emergency Stop button located either end of module. Deadman system available as option.

Earth / Overfill

Industry standard 10 pin overfill protection system with integrated earth check.

Structural

All framework is Hot Dip Galvanised for maximum environmental protection.



Full compliance and inspection to Australian Standards. Structure design has been fully developed for use in Tropical/Hurricane prone regions. AS Zone 4 cyclone rating.

Pipework

All pipework constructed to International Standards ASME / ANSI.

GANTRY ENVIRONMENT

Gantries can be located in a Zone 1 Class 1 hazardous area location requiring Exd, Exi or EXMe rated products. All products used shall have SAA approval. Copies of certificates shall be provided as part of the project documentation.

Design Temperature

Minimum Design Temperature = -10 Deg C

Maximum Design Temperature = +50 Deg C

Ingress Protection

IP65

Zone

Zone 1

Class 1

PRODUCTS ON MODULE

Main products used on the gantry are:

Equipment Description	Available for Slimline	Available for R.A.
Digital Flow Control Valve	Y,1,2	Y,1,2
V-groove Flow Control Valve	Y 1	Y 1
Turbine Meter	Y,5	Y,5
Prime 4 PD meter	Y,1,5,	Y,1,5,
Positive displacement Meter	N	Y,1,5,
Pre-Set Controller	Y	Y
Earth Overfill Protection	Y	Y
Air Eliminator	Y	Y
Strainer	Y	Y
Product Isolation Valve	Y	Y
Resistance Temperature Device	Y	Y
Exd Termination J-Box	Y,4	Y,4
Exe Field Termination J-Box	Y,3	Y,3
Additive Injectors	Y	Y
Emergency Stop Buttons	Y	Y
3-Min Dead-Man system	Y	Y
Pressure Gauges	Y	Y
Loading Arms	Y	Y
Vapour Connection	Y	Y
Flame Aresstor	Y	Y
Driver Interface (TAS system Only)	Y,6	Y,6

Denotes:

- Y = Available
- N = not available
- 1 = based on product
- 2 = have Viton Seals
- 3 = Exe Housing for interfacing gantry instrumentation to field connections
- 4 = Exd Housing for IS barrier devices and fibre optic Connections
- 5 = Meter used determined by product being loaded and flow rates
- 6 = If gantry used with Omega TAS system

PROCESS AND INSTRUMENTATION DIAGRAM

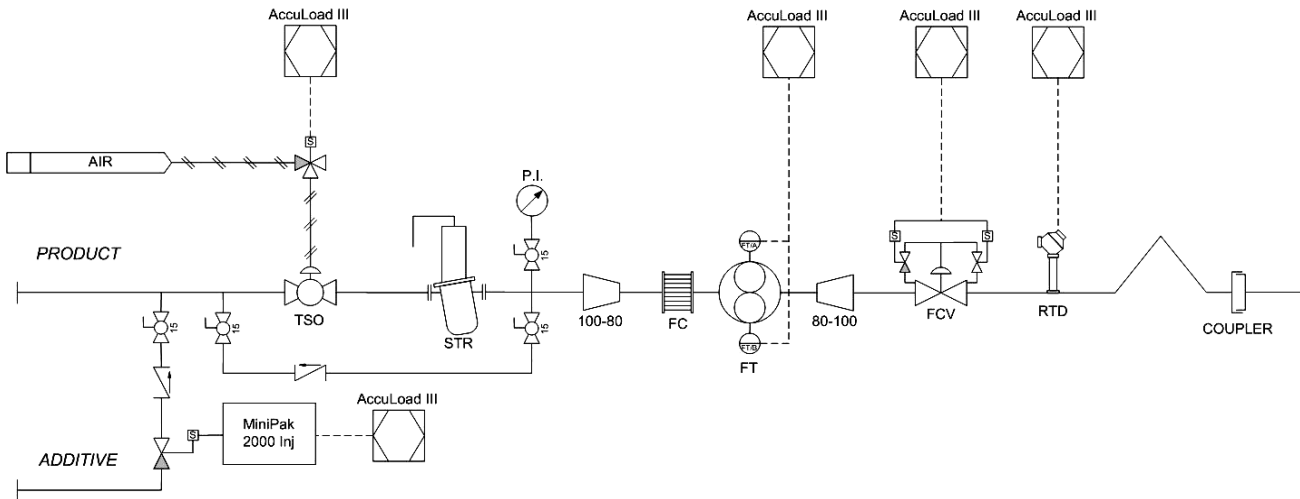


Figure 1 – Typical 1 Arm P&ID

SYSTEM / DIMENSION DIAGRAMS

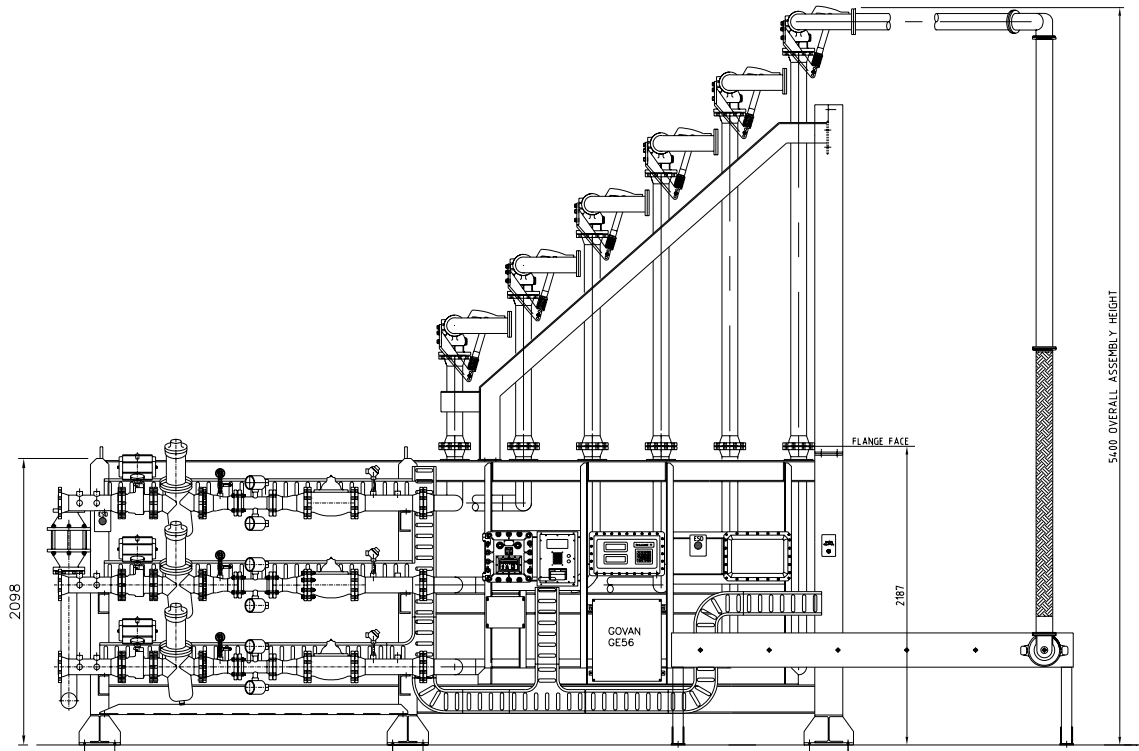


Figure 2 – Typical Slimline Gantry

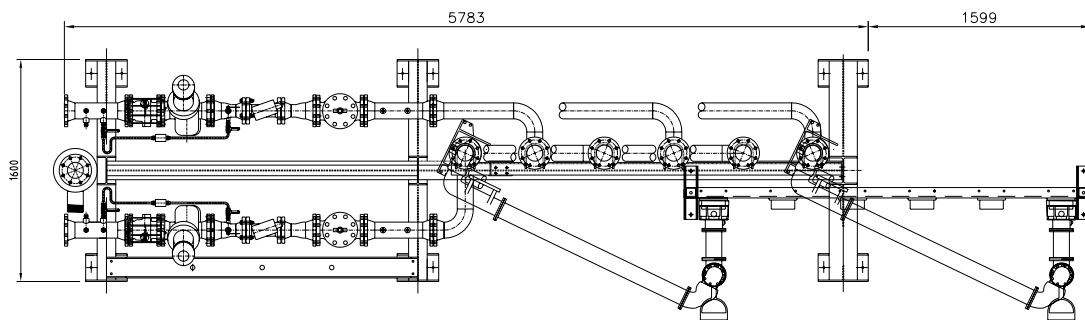


Figure 3 – Typical Slimline Gantry Plan Elevation

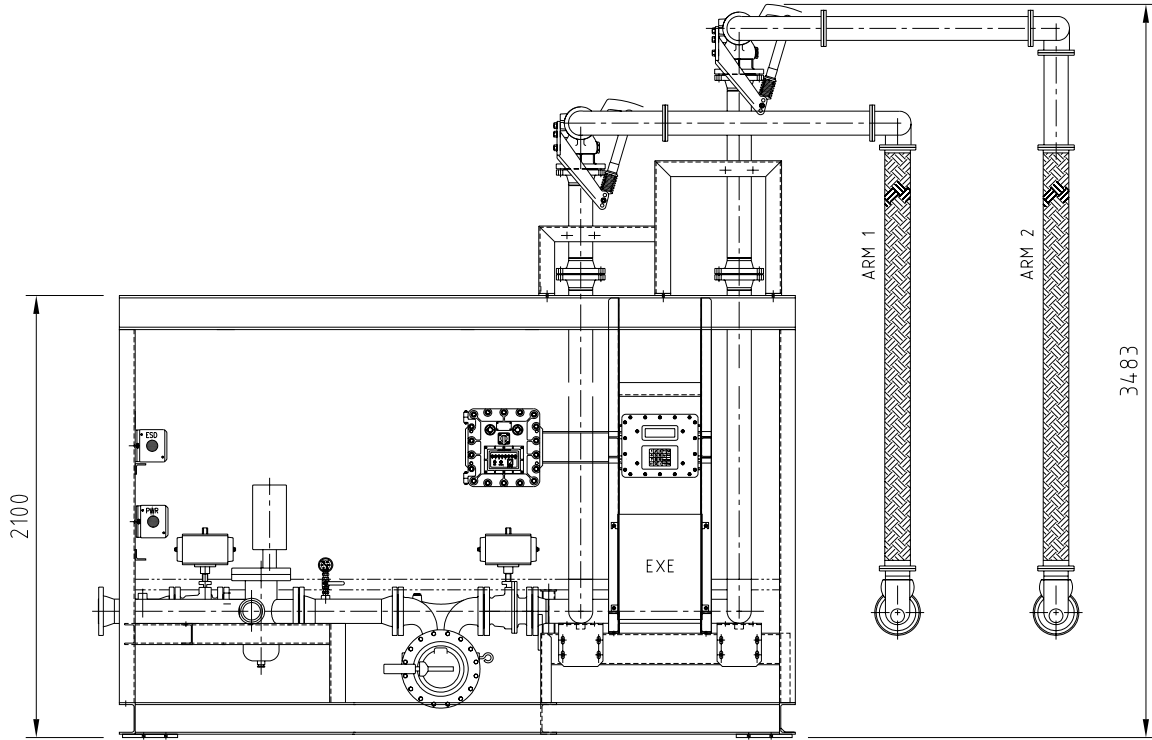


Figure 4 – Typical RA Gantry

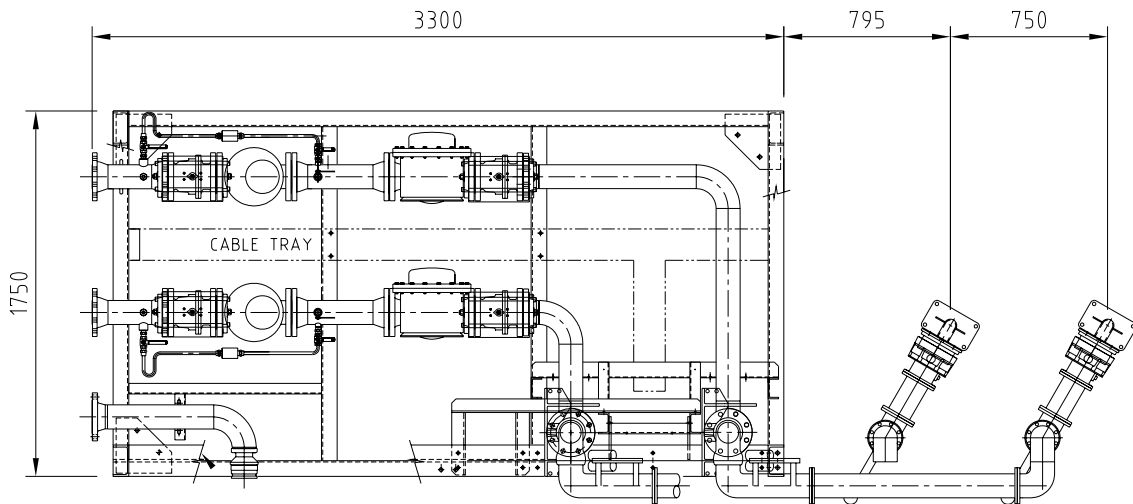


Figure 5 – Typical RA Gantry Plan Elevation

TESTING

Hydrostatic Testing
Standards done to ASME / ANSI

PHYSICAL CHARACTERISTICS

Weight (2 Arm RA Gantry)(kg)

Dry: 2,500
Wet: 2,800

Weight (6 Arm Slimline Gantry)(kg)

Dry: 3,800
Wet: 5,000

Steel Work Construction - AS 4100

Galvanising - AS1650

Pipework - ASME IX 2001

Painting

All pipe work is prepared for painting by shot blasting and/or sandblasting to AS1627.4 class 2.5 and is primed with appropriate primer for top coat.

Top coat: Two Pack re-coatable polyurethane enamel

Colour: Adwana Grey by Dulux

The three coat process is fully maintained to AS/NZS ISO 9001-2000.

Other by special request.

Painting – Supplied Products

To suppliers standard paint codes and colours unless other by special request

Compressed Air Requirement

At least 550Kpa. The air connection ½" NPT

Process Connection

All main piping connections are flanged 4" ANSI 150.

Bolts & Nuts

8.8 Galvanised structural for steelwork assembly.

Plated B7-2H stud bolts for process piping.

Electrical

240v AC, 50Hz single phase electrical power rated at 500 Watts

Power connections to the AccuLoad Controller shall be via a Uninterruptible Power Supply with suitable capacity to provide power to the AccuLoad unit for 30 minutes after a supply failure and an alarm system for notifying of a low battery.

Reference is made of Australian National Standards Commission Certificate Number S413 – section 1.5

Typical Power Consumption

SlimLine typical power consumption is 1000 Watts.
Right Angle typical power consumption is 550 Watts.

Cabling

All cabling is steel wire armoured to ensure maximum mechanical protection, with intrinsically safe cables being identified.

All gantry wiring is terminated to the Exe field termination box. Any cable that is glanded into an Ex'd enclosure will use Barrier Glands. All other field wiring may be conveniently terminated to this point.

Fibre Cable & Connections

If the gantry is used in conjunction with Omega TAS fibre cables need to be laid between the gantry and the Control Room.

Fibre cable shall be:

Optical wavelength:	850nm nominal
Connectors:	ST connectors
Type:	2 off twin cores as a minimum
Recommended:	DKI recommends additional cores are included for spares.

Product Input Pressures

Main Base Products

Typical: 500 – 600 kPa static
Minimum: 250 kPa @ 2400 LPM

Additive Products

Typical: 1100 kPa static
Note: Differential pressure of additives to main product must be greater than 310 kPa at all times.