TOMTEC'S PRODUCT LINE SUMMARY

TOMTEC

Tomtec began operation in 1967. Today we are a true original equipment manufacturer (OEM). We create and design new products for specific applications. We have our own engineering departments; mechanical, electrical and software. We do our own manufacturing and assembly. We currently employ 100 people and operate from 53,000ft^2 of manufacturing space.

Our company is tightly focused on providing automation for pharmaceutical research and specifically High Throughput Screening (HTS) and Genomics. In the USA we market all of our products direct to the user.

GENERAL APPLICATION INFORMATION

Tomtec markets very innovative and complete product lines for HTS. At the low end are our small frame Quadras with 3 shuttle stations. These are manual workstations. In the middle area are our large frame Quadras with 6 shuttle stations (with or without Stackers). At the high end is our Quadra 9600 system, for full robotic operation. The type of equipment we would recommend depends on the details of the users requirements. In general terms we look at the following information.

Is the application primarily plate filling or are specific time lines required. For example, take the protocols that are emplified by replicating daughter plates from mother plates. A manual Quadra workstation is the lowest cost. Throughput is primarily a function of the operator. If we add Stackers, operator attendance is only required to load and unload the Stackers. The addition of the Stackers adds automation, freeing the operator. These workstations can provide very high throughput. They are not limited to plate replication. In one pass, using pipeline pipetting, they can add several reagents (i.e. buffer, label, standards & controls and the specific compound to be tested). The finished plates are stacked, the tips are washed using our Flow Through or Ultrasonic Tip Washing System and the next cycle repeats.

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The above describes batch type operations where there are basically no time lines involved. On those applications where time lines are involved, more sophistication is required. Take the example of an enzyme assay that involves several steps of reagent addition, incubation, plate washing and reading. If the time range on each step is broad enough, batch processing may be used. As the time lines become more stringent, in line processing can provide better assay control. For this we have more complex workstations. At the top end is our Quadra 9600 system. This is a full robotic system that schedules individual plates through complex protocols.

QUADRA PRODUCT DESCRIPTIONS

In our Quadra product line we have two frame sizes. The small frame was designed to fit inside of a laminar flow hood. It has 3 shuttle stations. Our large frame Quadra has 6 shuttle positions. The shuttle positions define how many devices (i.e. reservoirs, plates, wash station, etc..) can be presented to the pipetting head.

We have three pipetting heads to go in the above frames. Our original Quadra96® head uses disposable tips. The maximum volume per tip is 450µl. At 10µl the C_v is 2% and down to 1% at higher volumes. Below 10µl the C_v becomes quite dependent on the specific assay protocol. Typically a C_v of 5% at 5µl and 5 %to 10% at 2µl. When used in the large frame Quadra, this head will support positive displacement pipetting up to 90µl and air displacement up to 450µl.

A second available head is our Quadra96®SV. This is a 96 well positive displacement pipettor. Its volume range is 0.5µl to 60µl. The third available head is our Quadra384™. This is a 384 well pipetting head. Both the 96SV and 384 use the same positive displacement needle arrangement. At 0.5µl the C_v is 2% to 3% on both models. They were specifically designed to transfer 0.5µl of compounds in 100% DMSO. This maintains a 1%DMSO solution in the final 50µl assay volume of a 384 well. This eliminates any pre dilution and the subsequent loss of compound due to solubility problems in concentrations less than 100% DMSO.

We have three stage models to choose from. The standard Quadra stage is designed to lift the specific device from the Quadra shuttle and present it to the tips. The stages are all stepper motor controlled. This permits very precise positioning of the tips within the wells of the plate. In addition to the standard stage, we have a reformatting stage. This permits offsetting 4.5mm to allow a 96 well pipetting head to serve a 384 well plate. The third stage, used in our Quadra-Plus™ and Quadra 3 models, have full X & Y indexing to permit doing serial dilutions, such as IC50 protocols.

On our large frame Quadras we can provide dual sets of plate Stackers. These will handle deepwell or standard microplates that meet the SBS footprint standard. The Stackers available for the Quadra-Plus™ and Quadra 3 can also restack. This allows first in to be first out on the next sequence.

The flexibility of the above options are augmented by a complete line of accessories. For tip washing, we have an Ultrasonic Tip Washing System. Testing with a control organism showed a decrease of 7 to 9 logs. A Tip Flow Wash System is also available. Special reservoirs are milled to meet the users format. This permits in line handling, using pipeline pipetting. Vacuum boxes are available for Solid Phase Extraction (SPE) applications or for filter plate applications. A Constant Level Recirculating Reservoir is available as is a battery operated Stirring Reservoir. A Peltier device is available to keep reagents cold.

HARVESTER96™

Our Harvester96™ line consists of a series of models that include both semi-automated and automatic instruments. The Harvesters have been designed to work with all available filter mats and plates currently used by pharmaceutical research scientists. The manual Harvester96™ that supports the Wallac BetaPlate are compact and easy to operate. The system used adjustable wash rate, pulse wash programs with removable wash tips. The instrument is quick and easy to Q.C. and is available with Autotrap accessories. The manual Harvester96™ is designed to provide the utmost flexibility in cell harvesting. Parameters are individually controlled to enable the operator to set the optimum conditions for any protocol.

The Harvester96™ Mach II, III, and IV represent state of the art technology in cell harvesting. This family of 96 well cell harvesters are fully programmable, with removable wash tips, overflow protection, and fast, efficient transfers. The unique double "O" ring seal prevents cross-talk between filter mat circles. If necessary, aluminum plates have a roller locking device. The clamping pressure may be simply adjusted by the user. The Harvester96™ is fully programmable, the user's creativity can be the controlling factor in setting up protocols. The user may set up to 16 protocols to meet individual criteria, using the front panel. Once established, the programs may be recalled or modified at any time. Repetitive precision is achieved by eliminating the variables of cell harvesting through the programmability of the Harvester96™. The Harvester96™ is a reliable instrument that can be easily maintained by the user.

QUADRA-PLUS

This is an advanced workstation. It is designed to fill the gap between Quadras with Stackers and our Quadra 9600 system. The Quadra-Plus™ is designed to run specific assays to completion in a batch mode (50 plates). It has two pipetting heads (any 2 of the above 3). It has two full indexing stages, served by an 8 station shuttle. There are two sets of dual Stackers. A plate washing head is available with interchangeable heads 96 or 384-well. A table mounted pick and place can transfer plates from the shuttle to a plate reader, such as the BMG Fluostar or Polarstar.

QUADRA 9600 SYSTEM

This is an automated robotic system. It is a fully integrated system using a robotic arm traveling on a 2 or 3 meter track. It is made up from a combination of the following devices, depending on the users requirements.

QUADRA-STOR™ INCUBATOR

- Holds 96 microplates or 48 deepwell plates, reservoirs or a combination thereof.
- Temperature control from 37°C down to 4°C, with Chiller.
- Humidity control to 90° R.H., CO_2 control to 10%
- Can provide shaking
- Access through a moving window curtain to maintain uniform temperature control during plate movements.

QUADRA-STOR HOTEL

- Holds 160 microplates or combination of Quadra tips, deepwell plates and reservoirs.

QUADRA-WASH 96/384

- Plate washer with 96 or 384 well interchangeable heads.
- Vacuum Box for use with filter plates.

HARVESTER 9600

- To harvest from assay plates to unifilter or similar glass fiber plates.

BARCODE LABELER

- Can feed 50 plates of six different types (300 total) into the system on demand.
- Each plate has a barcode label applied and verified.

ACCUMULATOR

- Collects and holds 300 plates at the end of the assay protocol.

READERS - The following 3rd party readers have been integrated into the system:

- BMG - *Fluostar*
- BMG - *Polarstar*
- Tecan - *Rainbow*
- Wallac - *MicroBeta*
- Packard - *TopCount*

QUADRA-SEAL (plate sealer)

- Designed to apply a seal on the inside bottom of a Unifilter plate or the top of any microplate.

QUADRA DIAL SECTION

- Quadra pipettor
- 10 Station Dial
- Lid Handling (four lids capacity)
- Vacuum Box for filter plates
- Tip Wash Station
- Dial cooling for reservoirs

QUADRA MODEL 240

- A 4 station inline Quadra to augment the main Quadra pipetting section.

HEPA FILTER

- Provides a sterile air curtain over the Quadra Dial Section for cell based assays.

SYSTEM LOGISTICS - The following components are mounted and wired under the table:

- Emergency Stop System - global or local
- Six Autotraps - for independent collection of hot and cold waste
- One 120-Liter Cold Waste Container
- One 120-Liter Hot Waste Container
- Two 50-Liter Buffer Supply Bottles on magnetic stirrers
- One Cold Buffer Supply
- One Chiller
- One Air Compressor
- One Vacuum Pump
- One Reagent Control System

The Quadra 9600 system is designed to run a variety of assays - enzyme, cell based, filtration either glass fiber or membrane, radioligand binding etc. The system runs under the Graphical Users Interface Control. It is programmed directly from the assay protocol. No software code is required from the user. A Barcode Reader, mounted on the robotic arm, tracks all transactions to maintain the audit trail. Tomtec currently has seven Quadra 9600 operating, one in Spain, one in the USA and five in Japan.

ULTRA HIGH THROUGHPUT SCREENING (UHTS)

Tomtec is currently developing a novel system for UHTS, using our MicroTape™. It is a sprocket driven carrier tape in the 384 well format.

MEGA-STOR™

This is a large plate storage system. It is designed to hold 1675 microplates or 850 deepwell plates or combinations thereof. It is an insulated jacketed enclosure that can operate from -10°C up to 37°C, depending on the heat source chosen (chiller or heater). It provides selective recall for any plate it contains. The input to the system may be manual through a door or automatic via Stacker cassettes. The output can be individual plates or Stacker cassette. It is also available with a Cherry Picker.

EQUIPMENT DELIVERY

Our standard Quadra and Harvester products we normally deliver within 45 days of receipt of order. A Quadra 9600 system may be six months depending on its configuration. Delivery on other systems depends on our manufacturing cycles at the time the order is placed.

PAYMENT TERMS

- On standard products - Net 30 days
- On custom designed products - 30% with purchase order
  40% at time of shipment
  30% at acceptance at user site