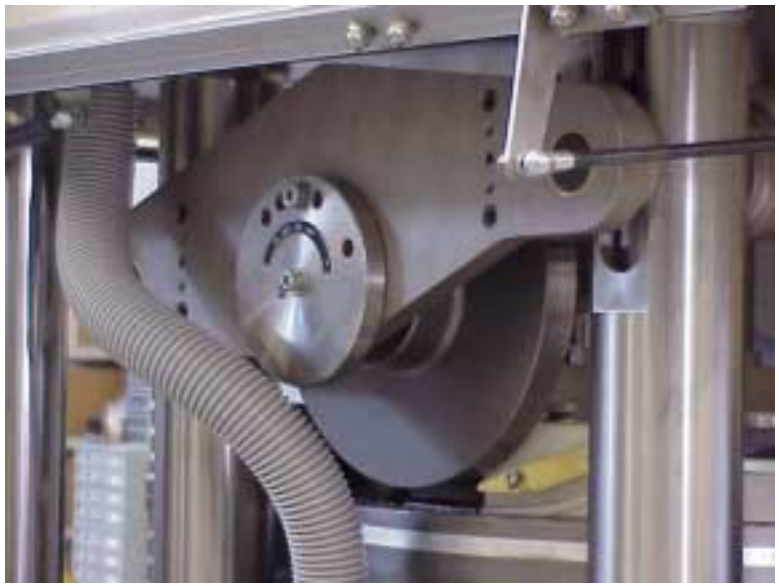
IPR M2i Tablet Press Pictures

M2i Tablet Press

Rotary Feeder

IPR M2i Tablet Press Pictures



Upper Pressure Roll with Punch Penetration

Drive Motor & Gearbox, Feeder Motor, and Overload System

Industrial Pharmaceutical Resources, Inc.
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SPECIFICATIONS OF IPR'S M2i TABLET PRESS

M2i: **39**, **51**, 55, 61 Stations

1. General Specifications
2. Compression Sub-System
3. Feeding Sub-System
4. Drive Sub-System
5. Lubrication
6. Weight Control
7. Access, Cleanability and Tooling Changeover
8. Machine Control Sub-System (PLC)

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1.0 General Specifications

	Configuration:	M2i Double Sided Press				M2i Single Sided Press with Precompression			
	Number of Stations:	**39**	**51**	55	61	**39**	**51**	55	61
1.11	Press Output								
	Tablets Per Minute (TPM)	3,744	9,293	10,022	11,115	1,872	4,647	5,011	5,558
	Tablets Per Hour (TPH)	224,640.00	557,593.20	601,326.00	666,925.20	112,320.00	278,796.60	300,663.00	333,462.60
	Revolutions Per Minute (RPM)	48.00	91.11	91.11	91.11	48.00	91.11	91.11	91.11
1.12	Overload Pressure	10 Ton Main	6.5 Ton Main	6.5 Ton Main	6.5 Ton Main	10 Ton Main 10 Ton Pre	6.5 Ton Main 6.5 Ton Pre	6.5 Ton Main 6.5 Ton Pre	6.5 Ton Main 6.5 Ton Pre
1.13	Depth of Fill (max)	13/16" 20.63mm	11/16" 17.46mm	11/16" 17.46mm	11/16" 17.46mm	13/16" 20.63mm	11/16" 17.46mm	11/16" 17.46mm	11/16" 17.46mm
1.14	Tablet Diameter (max)	1" 25.4mm	5/8" 15.87mm	7/16" 11.11mm	7/16" 11.11mm	1" 25.4mm	5/8" 15.87mm	7/16" 11.11mm	7/16" 11.11mm
1.15	Die Outer Diameter	1.5" 38.1mm	1.187" 30.16mm	0.945" 24mm	0.945" 24mm	1.5" 38.1mm	1.187" 30.16mm	0.945" 24mm	0.945" 24mm
1.16	Punch Size (Per TSM Specifications)	D Size	B Size	BB Size	BB Size	D Size	B Size	BB Size	BB Size
1.17	Upper Punch Entry	1/8" - 5/16" 3.1mm - 7.9mm	1/8" - 1/4" 3.1mm - 6.3mm	1/8" - 1/4" 3.1mm - 6.3mm	1/8" - 1/4" 3.1mm - 6.3mm	1/8" - 5/16" 3.1mm - 7.9mm	1/8" - 1/4" 3.1mm - 6.3mm	1/8" - 1/4" 3.1mm - 6.3mm	1/8" - 1/4" 3.1mm - 6.3mm
1.18	Height of Machine	77.4"				77.4"			
1.19	Drive Motor								
	Horsepower	10				10			
	Speed (60 Cycle)	1800 RPM				1800 RPM			
1.20	Dimensions								
	Floor Space	45.8" W x 59.1" D x 77.4" H				45.8" W x 59.1" D x 77.4" H			
	Space - Guards Open	85.8" W x 87" D x 86" H				85.8" W x 87" D x 86" H			
	Height - Guards Open	86"				86"			
	Approx. Net Weight (kg)	2360 Kg				2360 Kg			

NOTE:

1) All models are designed and manufactured to operate at maximum compaction forces of 10 tons (100 kN). B machines can be provided with 6.5 ton (65kN) tie rods which offer better sensitivity for weight control. Regardless of the tie rods used, the maximum compaction force will be dictated by the compressive strength of the punch tip.

2) * Designates increased number of stations from standard turret. Stainless Steel Die Table required.

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2. Compression Sub-System

	Configuration:	M2i Double Sided Press	M2i Single Sided Press with Precompression
2.1	Turret		
	Design	3 piece construction	3 piece construction
	Punch Seals	Upper & Lower Punch Seals	Upper & Lower Punch Seals
	Pitch Circle Diameter	53 cm	53 cm
	Upper & Lower Section Material	Cast Iron construction	Cast Iron construction
	Die Table Material	400 series Stainless Steel	400 series Stainless Steel
2.2	Camming		
	Design	Cycloidal Design	Cycloidal Design
	B Fill Cams	5/16", 1/2", 11/16"	5/16", 1/2", 11/16"
	D Fill Cams	5/16", 9/16", 13/16"	5/16", 9/16", 13/16"
	Material	High Density Plastic, Steel, or Aluminum Bronze	High Density Plastic, Steel, or Aluminum Bronze
	Guards	Lower Cam Guards	Lower Cam Guards
2.3	Pressure Rolls		
	Design	One Piece with Pre-lubricated Sealed Bearings	One Piece with Pre-lubricated Sealed Bearings
	Diameter	30 cm (Main Compression Roll)	30 cm (Main & Pre Compression Roll)
	Material	D2 or A2 Steel	D2 or A2 Steel
	Max Main Compression	10 tons	10 tons
	Max Pre Compression	None	10 tons
2.4	Overload System		
	Design	Hydro-pneumatic with Adjustable Setting	Hydro-pneumatic with Adjustable Setting
	Main Compression Rating	10 tons or 6.5 Tons	10 tons or 6.5 Tons
	Pre Compression Rating	None	10 tons or 6.5 Tons
2.5	Strain Gauging		
	Design	Wheatstone Bridge	Wheatstone Bridge
	Main Compression Element	Tie Rod	Tie Rod
	Pre Compression Element	None	Tie Rod or Roll Pin

3. Feeding Sub-System

	Configuration:	**All M2i Presses**
3.1	Feeder	
	Design	3 Paddle, Tool-less Changeover w/ powder discharge chute
	Material	Teflon Impregnated Anodized Aluminum
	Feeder Length	29 cm
	Feeder Platform	Gimbal Mount
3.2	Feeder Regulation	
	Design	Three Paddles
	Variable Speed	0 - 60 RPM
	Inlet Diameter	4.0"
3.3	Feeder Control	
	Design	Gear Driven from beneath the tablet press
	Motor	Lenze DC Motor with Gearbox
	RPM	3000 RPM
	Gearbox Ratio	25:1
	Controller	Lenze Controller

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4. Drive Sub-System

	Configuration:	**All M2i Presses**
4.1	Drive Arrangement	
	Design	Direct Drive utilizing Variable Frequency Drive & Tooth Timing Belt
	Gearbox	Wormshaft with Ring Gear Transmitted by VFD
	Ring Gear	Replaceable and mounted to the underside of the turret
	Rotation	Clockwise
4.2	Drive Motor	
	Design	Three Phase, AC Induction
	RPM	300 - 1800
	Horsepower	10
	Turret Speed	10 - 91 RPM B Size Machine / 10 - 50 RPM D Size Machine
4.3	VFD	
	Design	CE Certified
	Horsepower	15 HP
	Brake	Programmable Dynamic Brake
	Noise	Integral Noise Filters
	Enclosure	Protected Enclosure
4.4	Handwheel	
	Design	Metal Handwheel to allow manual rotation of turret
	Safety	Protected By Interlocked Door and Located Inside of Press

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5. Lubrication Sub-System

	Configuration:	**All M2i Presses**
5.1	Tooling Lubrication	
	Design	Intermittent Lubrication to Upper & Lower Punches
	Punch Heads	Grease Applied to Upper & Lower Punch Heads via metering cam & timer
	Upper Punch Barrels	Oil Applied to Upper Punch Barrels via felt pad & timer
	Lower Punch Barrels	Oil Applied to Lower Punch Barrels via turret groove & timer
5.2	Centralized Lubrication	
	Design	Continuous Lubrication from totally enclosed oil reservoir
	Pressure Rolls	Sealed Pre-lubricated Bearings
	Turret	Oil Applied via Turret Column & Bushings
	Drive	Oil Applied via Helical Gears & Bearings and Worm & Worm Wheel
5.3	Self Lubrication	
	Design	Integrate Self Lubricating Parts where applicable
	Feeder	Feeder gear train - phenolic & metal gears
	Weight Adjustment	Weight adjustment mechanisms
	Compression	Pressure cylinder forks, trunions, pressure shafts
5.4	Maintenance Lubrication	
	Design	Periodic Lubrication Requirements due to Press Maintenance
	Motor	Bearings
	Reservoirs	Visual Sight Levels for Periodic Refilling
5.5	Lubrication Alarms	
	Design	Shutdown Press & Notify Operator Due To Insufficient Lubrication
	Alarm 1	Low Circuit Pressure
	Alarm 2	Low Oil Tank Level

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6. Weight Control Sub-System

	Configuration:	**All M2i Presses**
6.1	Punch Flight	
	Design	Provide resistance to Lower Punch for tight weight control
	Flight Control Cam	Provide slight pull down of punch immediately following scrape-off
	Threaded Punch Plug	Provide positive lower punch restraint with quick change feature
6.2	Tail-Over-Die	
	Design	Cover filled die until upper punch enters the die
	Contact with Turret	Spring Loaded to float with die table
	Material	High Density Plastic
6.3	Feeder	
	Design	Three Paddle Variable Speed for optimum flow & weight control
	Feeder Pan	Flat within 0.001" for optimum yields
	Head Pressure	Site glass to monitor feeder volume
6.4	Discard Chute	
	Design	Discard Tablets During Start-up & Shutdown
	Material	Stainless Steel
	Control	Timer
	Tablet Reject (Optional)	Incorporated with PAC System to discard out-of-spec tablets
6.5	PAC System	
	Design	Control Tablet Weight & Reject Out-of-spec tablets via force feedback loop
	Hardware	Standard off the shelf components
	Software	Windows Compatible
	DSP Feature	Digitize forces to analyze compression waveforms
	Recipe Drive	Reduce Changeover & Set-up Time
	Troubleshooting	Diagnosis Problems (I.e. Sticking punches, starved feeder/hopper, etc.)
	Quality Assurance	Real-time Process Validation & Weight Scale Feedback / Verification
	Quality Control	Reject out-of-tolerance tablets

7. Access, Cleanbility and Tooling Changeover Sub-System

	Configuration:	**All M2i Presses**
7.1	Access	
	Design	Round Pillar Construction with removable doors & guards
	Upper Access	360 Degrees with 4 Hinged Guards
	Lower Access	360 Degrees with 2 removable doors & 2 removable enclosures
	Enclosures	Removable panel to access electronic components
7.2	Tooling / De-tooling	
	Design	Provide quick & easy access to install & remove punches
	Lower Punches	Single Piece Threaded Lower Punch Flight Restraint For Quick Changeover
	Upper Punches	Removable retaining plate for installing & removing upper punches
	Feeder Support Plate	Removable insert to access die locks without removing feeder support plate
	Handwheel	Easy access to handwheel for turret rotation
7.3	Tool-less Features	
	Design	Provide tool-less features where applicable for quick changeover
	Feeder Assembly	Incorporates tool-less design
	Cam Guards	Thumb Screws for tool-less installation & removal
	Scraper Assembly	Quick disconnect without removing feeder assembly
	Lower Guards	Quick release handles to remove lower doors & enclosures
7.4	Dust Extraction	
	Design	Eliminate dust and reduce changeover time
	Upper Guards	Downward Air Flow
	Die Table	Two dust extraction covers with tool-less design
	Lower Cabinet	Provide vacuum extraction at bottom of press
	Optional Feature	Add dust extraction within lower cabinet for additional cleanliness
	Air Requirements	275 CFM @ 6" W.C.

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8. Machine Control Sub-System (PLC)

	Configuration:	**All M2i Presses**
8.1	Hardware	
	Design	Utilize a PLC for machine control
	Specification	Allen Bradley PLC
	User Interface	6" color touch screen
	Optional Feature	10" color touch screen
8.2	Drive System	
	Design	Control start and stop of press via PLC
	Safety	Provide E-Stop on front & back of press
	Alarms	Shutdown press if alarm occurs & display cause
	Manual Start/Stop	Manual Start / Stop Button also provided
8.3	Tablet Thickness	
	Design	Incorporate LVDT & Stepper motors to adjust tablet thickness
	LVDT	Display Position of Compression Roll
	Stepper Motor	Pacific Scientific Motor located in roof of press
	Thickness Assembly	Gear Driven
	Controller	Allen Bradley Controller
8.4	Feeder(s)	
	Design	Display & Adjust Feeder Speeds via PLC touch screen
	Alarm (Optional)	Shutdown press via sensor in hopper or feeder inlet
8.5	Lubrication	
	Design	Control lubrication sub-systems via PLC
	Alarms	Shutdown press due to low lubrication levels or pressure
8.6	Air Pressure	
	Design	Control Hydraulic Overload Pressure
	Alarms	Shutdown press due to low air pressure levels
8.7	Safety	
	Electronic	Electronic component & cabinet guards interlocked with main power
	Guards	Upper & Lower machine guards interlocked
	Alarms	Shutdown & Alarm Display of individual door status