110 150 200

KOMATSU

HIGH PERFORMANCE SHOULD NOT BE OPTIONAL

The H1F-2 Servo-driven Press:
Designed for Superior Flexibility and Accuracy.

- Repeatable Die Height position in microns
- Ideal for progressive, transfer or manual die operations
- Incorporates modern, state of the art A.C. servo technology into mechanical stamping press designs
- Ability to control slide velocity and direction throughout the stamping work being done. Optimal slide motions can be set for any application
- Maintains working energy throughout stroke regardless of slide velocity
- Provides ability to dwell at position to allow timing of secondary work within the press production cycle
- Improved part quality
- Increased die life
- Ability to program multiple motion paths before returning to ether top dead center or programmable cycle start position (Pendulum Mode)
- Automatically maintain and adjust slide position to assure consistent die height or load (tonnage)
- Elimination of maintenance mechanical components like the Clutch-Brake unit and Rotary Union air connection
- No proprietary servo motors or servo motor controllers are used
- Reduces die tryout time and expense
- Saves energy cost by reducing electricity consumption

A Higher Level of Standard Equipment for Increased Performance

- U.S. standard bolster and slide machining (JIC)
- Heavy plate, rigid frame construction
- Available in gap-frame or solid side-frame design
- Pre-machined, heavy-duty cast slide with removable adapter plate
- Precision oil-lubricated long 6-point gibs
- Automatic lubrication of main drive components
- Quick-responding, dependable hydraulic overload protector
- Shock-resistant, pendant-mounted HMI (Human Machine Interface)
- T-stand for easy set-up and operation
- 200 Job storage memory
- Safety block with control system interlock
- Air counter-balance system

The Komatsu Warranty

When a press is designed as a system, it should be expected to perform as a system without routine tear downs for wear items. That's why every Komatsu H1F press comes with a Two Year Unconditional Warranty on anything that rolls, slides or glows—parts and labor. Unlike other manufacturers, there is no hourly limit—your press is guaranteed to perform 3 shifts a day, 7 days a week, 365 days a year. With Komatsu systems engineering it's possible to extract the full potential from your press, and the full revenue potential from every job.

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H1F-2
110
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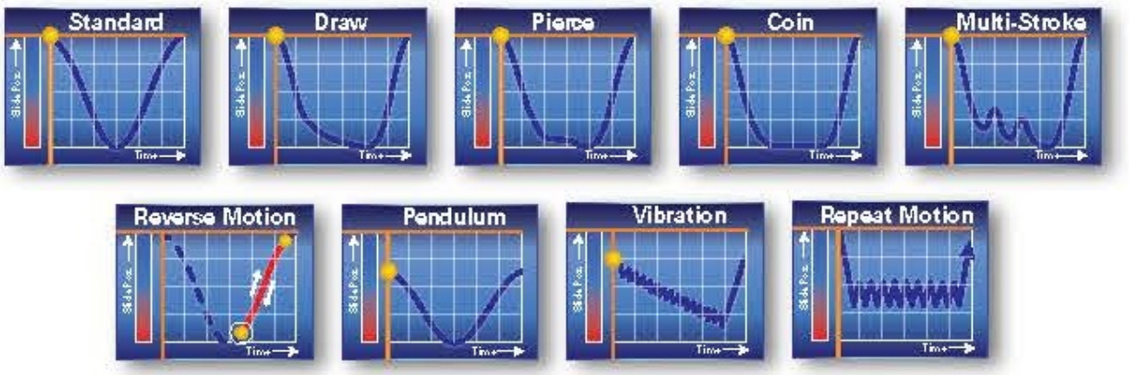
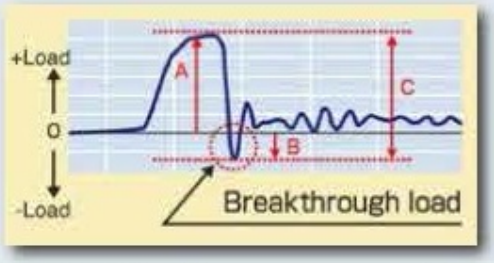
200

Komatsu H1F-2 Hybrid AC Servo Presses



Operator Performance Features

Standard Electronic Load Monitor continuously monitors loads in all press operations. To protect your die and your machine, the press stops automatically when it exceeds the values set by the operator for the overload or lower limits detecting one of three points: (A) maximum tonnage, (B) reverse tonnage, or (C) amplitude of the range.

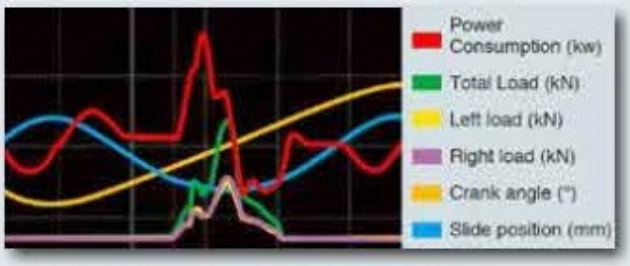


Free Motion setting allows the operator to save motion paths and die specific timing data under any of 200 die storage jobs. Each job is fully customizable or the operator can start with any of the 18 preset motions to allow operators use servo technology immediately or customize the base motion path and save as its own unique program.

Job Specific Die Height values can be saved under each specific job to reflect a Production value, and two different die set values. The machine shut height can be automatically adjusted during die setup to speed up die changes.

Optimized Motion
A motion program automatically created by the press control based on user programmed percentage of velocity at a settable start/stop interval, for optimal throughput.

The on-board Visual Inspection System (VIS Lite) measures and shows the slide position and load on every stroke. This allows for immediate quality control monitoring. It also works with the Optimizing Motion System (OMS) to detect the die touch point and automatically create a motion path using the data from the machine itself.



Standard Features

1 Drive Layout

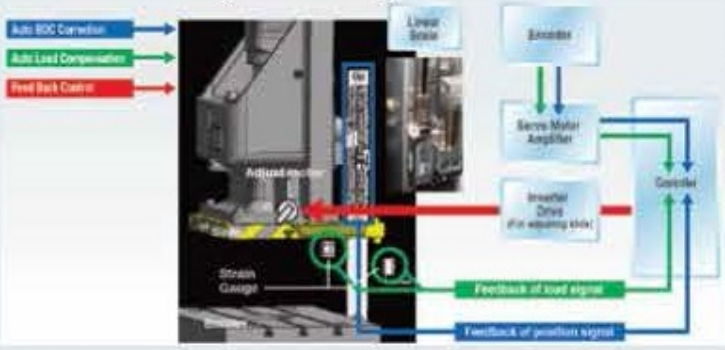
Komatsu engineering has combined today's modern A.C. servo technology into mechanical press design to provide a versatile, efficient and reliable solution to the changing demands of today's pressroom, which incorporates a standard catalog listed servo motor from a proven motor and control system manufacturer. No proprietary servo motors or servo motor controllers are used. The main gear and drive pinion gear have helical cut gear teeth. Shaft connection to the main gear is by spline cut teeth, not a taper key and key way. The crankshaft is supported by bearings before (front) and after (rear) the pitman connection cap and at the driven end of the shaft with the main gear.

2 Accuracy within microns

A Linear Scale is mounted to the frame of the press and monitors slide position to assure repeatable die height consistency at the bottom of the stroke where the work is being done. The linear scale is mounted to a sub-frame, fixed at the bottom to assure slide position accuracy and allowed to "float" at the top while the press frame is under load.

3 Auto Die Height Adjustment
Auto Tonnage Control when selected for use by user

The linear scale continuously monitors the slide position to assure consistent die height (slide face to bolster top). The two (2) strain gauges of the electronic load monitor system read the tonnage applied every stroke. As both the liner scale and strain gauges send data to the control, the operator can select to either control the die height or the applied tonnage. Die height adjustments and tonnage settings are automatically made during the continuous mode operation of the press.



4 Centralized Recirculating Lubrication System

Constant pressurized flow of oil to the bearings, journal, and gibs, which then flows into a recovery tank equipped with dual filtering before reuse.

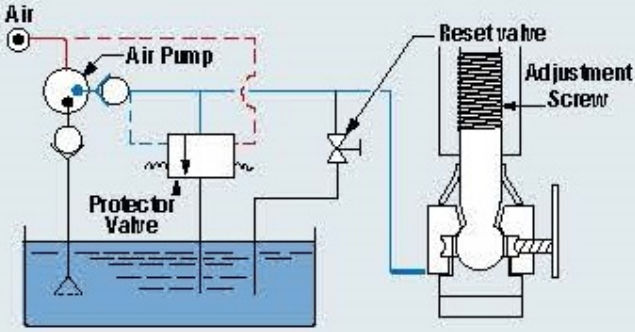
5 Drive system and control

Komatsu AC servo technology. Dual timing belts are used to couple the servo motor to the drive train, which are constantly monitored electronically for motion and breakage. The belts help to isolate the servo motor from the reverse shock (snap through) inherent to stamping blanking type operations.

The Manual Pulser control mounted on the front side of the operator "T" stand, operates only in the Jog Mode of operation. This control allows the operator to "micro-step" the slide stroke motion, in either the Up or Down direction. Useful in initial die tooling set up, and process verification. The Manual Pulser control is used in conjunction with either one of the "run buttons" to maintain the "Two Hand Control" operation requirement for the operator.

6 Hydraulic Overload Protector

Helps prevent damage to the press and dies. All Komatsu presses are equipped with a hydraulic overload protector, a standard feature that has been a Komatsu standard for decades helping to protect against damage to the press or tooling. If the rated load of the press is exceeded at BDC (Bottom Dead Center), the press stops automatically. The hydraulic pressure can also be manually released easily, to allow operations to resume quickly if part jamming occurs.



7 SIT IV© - System Integrated Terminal

Advanced electronics technology provides user-friendly operation and outstanding reliability. The SIT IV electronic press control unit is designed to provide the fastest, easiest, and most reliable control available for all press functions. Included as standard equipment on the Komatsu H1F press, SIT IV incorporates all the latest thinking in press control unit design.

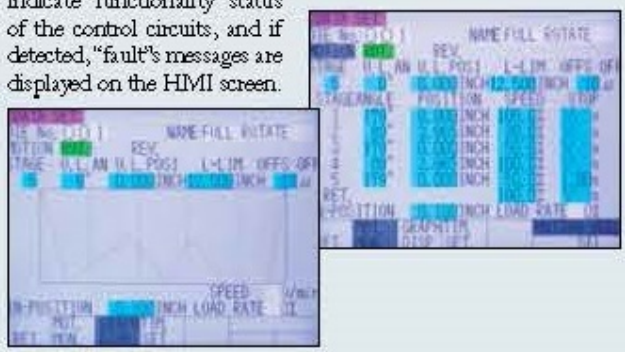
- All information necessary for press set-up, start-up, operation and diagnostics is available in one display, at the touch of a button.
- Language terminology and graphics are user-friendly, easily understood by the press operator in plain view in one central location on the digital display. Display also includes plain language description of fault messages.
- Multi-Lingual display that is operator selectable: English/Spanish/Japanese.
- SIT IV has the ability to integrate with current press room equipment, such as electronic coil feeds.
- Operator "T-stand" control interface houses all switches and push-buttons required for ordinary press set-up and operation, including Push Buttons for slide height adjustment. Also included is a hand operated micro-stepping slide motion control "pulsar" wheel for "fine" slide motion control in the Die Setup/Jog mode.
- Die Data job storage function can store 200 jobs and retrieve motion path and die setting data. Some of the many job functions that are retained in storage include ejector cam, programmable limit switch, and die protection detection operation angles, programmed press speed, motion path positions for velocity and dwell changes, and automatic shutheight position, among many others.
- Alpha-numeric entry of die name and memo data for easy cataloging and referencing.
- 8.4" Color Screen
- Digital Production Counters
  1-Total Run, re-settable
  1-Die Maintenance
  (pre-set up or down count), re-settable
  1-Lot (Batch)
  (pre-set up or down count), re-settable
- 1- Pneumatic air ejector with cam angle control
- Operation Mode Selections
  (located on the Operator "T" stand):
  (1) Home, (2) Off, (3) Inch, (4) Single Stroke, (5) Auto Single Stroke, (6) Continuous, (7) Jog (When in Die Set-up Operation Mode) Allows immediate change of slide motion direction with the turn of a switch.
- Electronic Peak Load (tonnage) Monitor (2-channel) with "reverse" load monitoring available
- 10 Stage (step) free motion programming
- 11 Electronic Rotary Cam outputs
- Automatic Slide shutheight positioning during Die Set Up/Die Change operation
- V.I.S. Lite (Visual Inspection System)
  (500 measurement points displayed, each point recorded at a set time interval (minimum of 1ms))
- Ethernet port for machine communication capabilities.
- Energy Monitor
- Coil Line Interface
- Quick Die Change Interface

Simple guidance. SIT IV displays operational procedure guidance for select press functions. Intuitive, user-friendly prompts guide press operators in a logical series of steps, for faster, more reliable press set up and operation. The SIT IV pendant is also used for all motion programming. Slide velocity is adjusted in percentage values of full velocity. When a velocity change is desired, the position where this change occurs can be set by actual slide position or in degrees of operation. The slide motion can be programmed to multiple stages before a complete return to Cycle Start Position (CPS) must occur. This motion path programming ability is available in the "traditional" full revolution cycle mode, and in the reduced stroke length "pendulum" mode.

Printed Circuit Surface Mount Technology design gives outstanding reliability.

- Integrated Circuits are used for all Logic Control circuits
- Increased safety, longer operation life and high reliability

Digital display for improved operation performance. Digital display of the crank angle and electronic angle detectors provide increased accuracy for press operations. Operation setting and die set-up functions are easier and faster for press operators, with precise, reliable settings every time. To protect the integrity of all electronic systems and provide additional safety, monitor lamps indicate functionality status of the control circuits, and if detected, "fault"s messages are displayed on the HMI screen.



Optional Features

Vibration Isolating Pad	**Die Cushions**
Slide Knockout (mechanical)	**Additional Air Ejector with Cam**
Photoelectric Safety Equipment	**E-Stop Receptacle**
4 Channel Die Protection Monitor	**Top Stop Receptacle**
Quick Die Change System	**Die Space Light**

Remote locatable SIT-IV Pendant on floor stand.

Warning - For protection of the operator, "point of operation" (use) guards should be used at all times. ANSI B11.1 specifies point of operation guarding is the user's responsibility, therefore such guards are not included with the machine.

Note - Stopping Performance monitor and control reliability. This control meets the current requirements of O.S.H.A. Standards Section 1910.217 and ANSI B11.1.

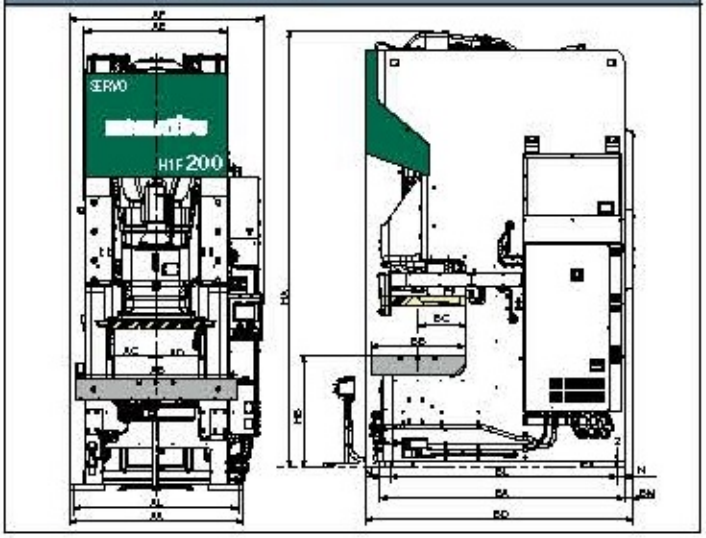
Automation Complete turn-key Komatsu designed press systems including coil lines, die carting and systems engineering tailored to your specific application.

Monitor slide motion and velocity, —right from your Ethernet (LAN)-equipped laptop or PC!

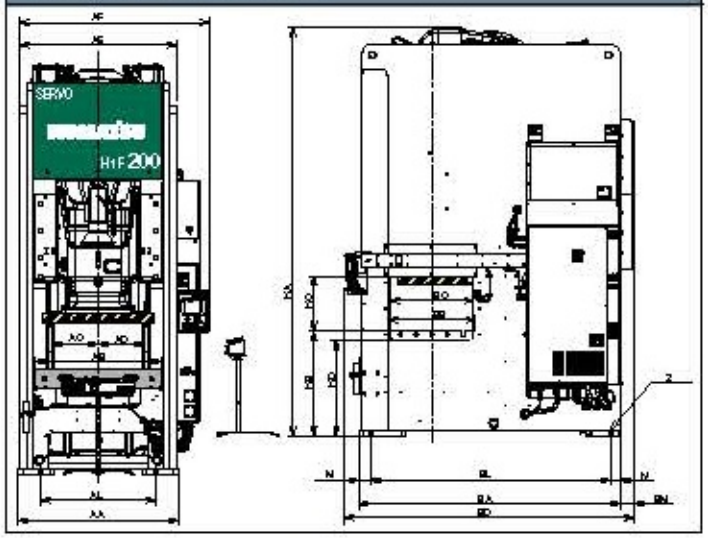
Full PC version of VIS increases measurement point recorded up to 5000 points.

- Slide motion (from actual operation) and speed
- Maximum loading point
- Monitors precise touch points
- End of forming process

General View ("C" Frame)



General View ("O" Frame)



Specifications (inches)	("C" Frame)			("O" Frame)			
	H1F 110-2	H1F 150-2	H1F 200-2	H1F 110-2	H1F 150-2	H1F 200-2	
AA	46.46	51.57	61.42	46.06	53.54	60.24	AA
AB	43.31	49.21	57.09	35.43	42.13	47.24	AB
AC	10.87	12.17	15.35	12.44	14.53	17.13	AC
AD	10.87	12.17	15.35	12.44	14.53	17.13	AD
AE	39.23	43.74	50.83	44.49	51.97	58.66	AE
AF	55.43	60.75	69.09	58.11	65.31	71.54	AF
AL	42.91	48.43	56.02	32.28	38.98	43.23	AL
BA	67.13	75.04	86.46	78.15	88.62	98.70	BA
BB	26.77	29.92	33.07	26.77	29.92	33.07	BB
BC	14.17	15.35	16.93	24.80	27.17	31.50	BC
BD	89.04	94.92	108.74	89.04	95.43	108.94	BD
BL	57.28	63.43	77.01	68.31	77.99	90.43	BL
BM	2.03	0.51	2.99	2.03	0.51	5.12	BM
HA	126.58	132.99	154.17	126.58	132.95	154.21	HA
HB	35.43 Std / 34.25 Long	35.43 Std / 34.25 Long	39.37 Std / 38.19 Long	35.43 Std / 34.25 Long	35.43 Std / 34.25 Long	39.37 Std / 38.19 Long	HB
HC	—	—	—	16.34	19.13	20.87	HC
HD	—	—	—	32.28	32.28	36.22	HD
M	4.92	5.91	4.53	4.92	4.92	4.53	M
N	4.92	5.71	4.92	4.92	5.71	3.74	N
Z	1.26	1.42	1.42	1.26	1.42	1.42	Z

Model Specifications			H1F110-2	H1F150-2	H1F200-2	H1F110-2	H1F150-2	H1F200-2
Frame Type			Gap Frame			"O" Frame		
Max. Capacity		US ton	121	165	220	121	165	220
Rating Point		in.	0.20`	0.24`	0.24`	0.20`	0.24`	0.24`
Stroke		in.	7.87`	9.84`	11.8`	7.87`	9.84`	11.8`
Speed		s.p.m.	70	60	50	70	60	50
Pendulum Stroke		in.	1.18` - 5.91`	1.18` - 7.87`	1.18` - 9.84`	1.18` - 5.91`	1.18` - 7.87`	1.18` - 9.84`
Pendulum Speed		s.p.m.	-138	-128	-124	-138	-128	-124
Die height	STD	in.	13.78`	16.54`	17.72`	13.78`	16.54`	17.72`
	Long	in.	14.96`	17.72`	18.90`	14.96`	17.72`	18.90`
Slide Adustment		in.	3.94`	3.94`	4.72`	3.94`	3.94`	4.72`
Slide	Width	in.	24.41`	27.56`	33.46`	27.56`	32.28`	41.34`
	Depth	in.	20.87`	21.65`	25.59`	20.87`	21.65`	25.59`
Bolster	Width	in.	43.31`	49.21`	57.09`	35.43`	42.13`	47.24`
	Depth	in.	26.77`	29.92`	33.07`	26.77`	29.92`	33.07`
	Thickness	in.	5.91`	6.50`	7.09`	5.91`	6.50`	7.09`
Counter Bal Cap		lbs.	772	1102	2205	772	1102	2205
Main Motor		h.p.	40	70	80	40	70	80

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